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HINTS TO HOMESEEEKERS

A BOOK OF

AGRICULTURAL OPPORTUNITIES

W. J. GEIB



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HINTS TO HOMESEEEKERS

A HANDBOOK OF

AGRICULTURAL OPPORTUNITIES

PREPARED BY

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INTRODUCTION.

During the past two decades there has been a more rapid movement from the older established communities into the newly developing sections of the United States and Canada than during any previous period of equal length. For various reasons many farmers have left their old home surroundings and have established new homes in sections where land values are lower, but where opportunities for higher development are promising. Thousands of people in the cities and towns have become land hungry and the "back to the land" movement has assumed considerable proportions. People in the various professions and in practically all walks of life are today giving more thought and consideration to the question of securing their living, in part at least, directly from the soil, than ever before in the history of our country.

It is our object to analyze very briefly a few of the conditions surrounding this movement and to inquire into some of the reasons why the feeling of unrest and the germ of discontent has taken hold of so many people.

It is also our aim to give such information, concerning the agricultural and soil conditions in the United States and Western Canada, as will assist those desiring a change in selecting locations in which to establish permanent farm homes, and to point out other reliable sources of information which should be drawn upon freely. The country is flooded every year with highly colored literature advertising farm lands, colonization propositions and all sorts of real estate schemes in all parts of the country. Much of the information given out in this way is misleading to say the least, and a large number of people are influenced to buy a farm in some "land of promise," whereas

if they were thoroughly familiar with the actual conditions their decision might be quite different. If only reliable information concerning farm lands could be circulated, thousands upon thousands of dollars would be saved annually by those who are often sadly in need of the money, but who are sincere in their desire for a farm home.

There is an increasing demand at the present time for such information as will assist a prospective purchaser in selecting land in any part of the country to which he might wish to go. Most of the literature now in circulation on the subject deals chiefly with some particular region or state and very frequently a broader general knowledge is desired before specific localities are selected for more detail study. The volume here presented is designed to assist in answering this call and to aid in guiding land and homeseekers by pointing out some of the agricultural opportunities offered in various localities.

It is recognized that the effort put forth here is crude and that defects are numerous, yet it is believed that the work is of sufficient value to justify its publication. It is the plan to revise this edition as soon as sufficient data can be collected, and enlarge its scope to include more detailed information concerning all portions of the United States and Western Canada.

The author takes this opportunity of acknowledging the valuable assistance rendered by the United States Department of Agriculture in permitting the use of data collected and published by various Bureaus. The work done by the Bureau of Soils, the Bureau of Plant Industry and the Weather Bureau has been freely drawn upon, as has also the work of the U. S. Geological Survey, State Geological Surveys and various Agricultural Experiment Stations of the country. The material thus collected has been used largely as a basis for the work and this has been supplemented by data collected by the author after ten years devoted to the study of soils and agricultural conditions in various parts of the United States.

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HINTS TO HOMESEEEKERS.

CHAPTER I.

SOME REASONS FOR DESIRING A CHANGE OF LOCATION.

In every movement which has for its object the changing of the policies of a nation, state or community there are always a combination of conditions or circumstances which finally result in bringing about a transformation, but it is seldom that any one of these conditions would be sufficient in itself to influence public sentiment to any considerable degree. It is just so with individuals, and when a person makes a decision which is of sufficient magnitude to change the whole course of his life it is reasonable to assume that a number of causes have contributed to bring about this change of mind. During the past two decades there has been a more rapid movement from the old established portions of the country into the new, than during any other previous period of equal length. This is a subject of vast importance to the nations concerned and a question of great consequence to the individuals who go to make up this army of homeseekers. As this movement is still going on and increasing in extent from year to year, and as thousands of people throughout this and other lands are now considering whether or not it is best for them to make a change, we wish to briefly analyze the subject and point out some of the causes which tend to influence people to desire a change of location.

Among the many conditions which have a tendency to create a feeling of unrest and dissatisfaction within certain classes in many of our old and highly developed portions of the country, the high and increasing value of farm lands may be considered as an important factor. The man who secured his land from the Government or purchased it for a song and has grown rich on

the returns from his farm and independent from the greatly increased valuation of his property does not share in this feeling of unrest. The man who has worked for wages, however, and has managed by habits of thrift and economy to lay by a small amount, hesitates to pay \$100 per acre for land which could have been bought for \$10 per acre twenty years previously. He naturally feels that if he can find a section of country where good land can be secured cheaply; where he can get good returns for the labor on his own land and at the same time have his holdings increase in value, it will be to his interest to establish himself in such a locality. It is while in this frame of mind that one is easily influenced to change his location and especially so when the opportunities in some new section of country are shown to be very promising.

Where land values range from \$100 per acre up and it is necessary for a purchaser to go in debt for most of his farm it usually means very hard work, slaving and grubbing for a long period of years before the mortgage can be lifted and the family feel that they are free and have a home which is really their own. It often happens that when this time comes the people are too old to fully enjoy the comforts for which they have worked so faithfully. This is especially true with all lines of general farming where the system followed is extensive rather than intensive and where the methods followed and crops grown are not those best adapted to the soil and prevailing conditions. The man of limited means facing the problem of selecting a farm in a location best suited to his needs often prefers to go into a new section where the land is cheap, even if there are a number of unpleasant features to contend with. The pioneer life appeals to some and the increased value of property which is sure to keep pace with development is always a very strong drawing card.

In many families throughout the country districts there are often more children than can settle on the old farm and when they grow up and are about to start in for themselves it is necessary to decide as to the location of their future home and the

nature of the work that will be performed. Unfortunately many go to the large cities, some remain in their home community, purchase high priced land so as to be near parents and friends and are willing to assume a heavy debt in order that the advantages of the old home community may be secured. A number take up land in newly opened sections where values are low but the outlook promising. As development is now going on no one region remains very long in what would be called a pioneer stage. It often happens that land values double and sometimes treble in the course of four or five years because of the rapid increase in population and the attractive opportunities which are presented.

Reference may here be made to the states of Iowa and Illinois where land for general farming purposes has reached a higher value than in any other section of the United States covering so large an area. Fifty years ago almost any amount of this black prairie land could have been bought for \$10 per acre. At the present time much of it is held at from \$125 to \$250 per acre and banks will loan nearly the full amount of the valuation on first mortgage security. Those who secured this land twenty-five or more years ago have grown wealthy on the increased value of their property. Many of these well-to-do farmers have retired from actual farm work and have moved to town to spend the remainder of their days in peace and quiet. Some of them even put their surplus money in more of this expensive land and rent their entire holdings. This has been going on to so great an extent that the average size of farms in these two states is actually increasing and the population of the rural districts is decreasing. When one farm is absorbed in this way it means that one family must find some other locality and it very frequently happens that they immediately seek for a home in some newly developing region where the soil is rich, the land cheap and the possibilities for rapid growth promising.

Portions of the state of New York afford an illustration of a somewhat different sort. Many of the older farms throughout

the state were abandoned a number of years ago because the yields which were secured were no longer profitable. This reduced yield was due to the fact that the methods of farming followed were not such as tended to keep up the productivity of the soil. The same crops were grown upon the land year after year and but little was returned to the soil to supply the plant food taken off by the crops. When the cheap land of the west came to the attention of the discouraged New York farmer it appealed strongly to him and he left his old home for a section where virgin soil could be secured for a few dollars per acre. The old farm may have been sold for what it would bring if a buyer could be found, but for a long time such farms were a drug on the market. Some of the land owners from the Empire State went into other lines of business which permitted them to remain at home, allowing their farms to remain idle. Thus it is that even at this time there are many abandoned farms in New York. The great opportunities offered in the reclaiming of these abandoned farms by new and improved methods of culture will be discussed in another chapter and the question will arise whether the opportunities offered in some of the older states are not equal to those in the undeveloped regions.

A large number of foreigners who come to our country each year settle on farms and most of them begin in the new sections because land is cheap and because they can form communities of their own better than in the older and well improved regions.

The congested condition in many of the large cities, the uncertainty of steady employment, the unhealthful conditions existing in some of the communities and the high cost of living are some of the things which turn the attention of many of the city people to the country and assist in adding recruits to the "Back to the Farm" movement.

In the crowded tenement houses, the stuffy rooming places, the fine apartment, the comfortable cottage or the fashionable hotel, the germ of discontent may find congenial surroundings. The mechanic, laborer and shop girl confined closely to their work

under conditions which are sometimes far from sanitary, frequently become broken in health and no longer able to be at their post. Much of the wage is usually required for the necessities of life and when the income is cut off a very unfortunate condition prevails. When such a stage is reached or it is realized that this may be the lot of a large number sooner or later, the question of going into the country is often considered. Many prefer to live in the city even though it is difficult to save anything because the glare, the hustle and bustle and the social advantages appeal to them, but there are also a large number who would gladly leave the city and settle on a farm if they knew anything about farming. Some are anxious and willing to make the change and learn as they go.

The clerk in a store at from \$40 to \$60 per month who has to keep up a good appearance and wishes to take advantage of some of the opportunities offered by the city, has a difficult task to save anything out of his salary. All clerks cannot become heads of departments and the wages of the majority are not rapidly increased. The future in this line does not offer much and many clerks cast longing eyes toward the country and wish for a home amid the green fields.

The country often appeals to many city people who are in comfortable circumstances, but who prefer the freedom and expanse of the rural districts. Some of these frequently take up the actual management of a farm, while others may spend only a portion of their time in a country home for a period of rest. Varying degrees of success are attained by city people who undertake to operate a farm, but if careful study is given the subject, as would be done if any other business were being undertaken, the possibility of failure will be reduced to the minimum.

The high cost of living, especially in the cities, is one condition which creates a feeling of unrest among a large number of people. It is almost impossible for the head of an average family to earn enough alone so that when all of the expenses are paid there will be a little left to put aside for a rainy day. Dur-

ing the past fifteen years a number of articles in common use and some necessities have increased in price over 100 percent, but wages have not advanced in proportion. For this reason the condition of the working man, in so far as he is able to save, has grown worse instead of better. If this average family were on a farm, which could be bought for a small amount in some newly developing section, they could at least make a living, which is all they can possibly do in the city. Then they would have the benefit of the open air with plenty of health giving sunshine, and if they were at all industrious they could in all probability make sufficient to enable them to live in comfort. While the high cost of clothing and the like would apply to the country as well as to the city it would not be necessary to have such costly garments. Practically all of food or its equivalent could be raised on the farm and thus the large grocery bill done away with to a great extent.

Changes in location are often made necessary by reason of the poor condition of a person's health. The individual who realizes that he has contracted tuberculosis, or that he is apt to do so, will make every effort within his power to put his body in the best possible condition to resist the dread disease. It may be necessary for him to move into some region where the climatic conditions are different from his home. It may also be necessary for him to change the character of the labor which has been performed as a means of making a living. There are a large number of diseases which are most readily controlled or cured under certain climatic conditions and so if these conditions do not prevail where one resides a change of location becomes necessary. The air in the vicinity of large manufacturing centers is so contaminated with injurious gases that such places are not at all favorable for the treatment of diseases. Many of the laboring class, however, are obliged to remain where they are taken sick because of their lack of money, even though they strongly desire to get out into the clear, pure air. Probably the varying condi-

tion of health accounts for the desire for a change of location as frequently as any other one cause.

The desire to speculate is strong in many people and it often leads them to leave the old established communities and go into remote sections where there is a possibility of development. The cut-over timber lands of Michigan, Wisconsin and Minnesota give an illustration worthy of note. When the timber was first removed much of the land was considered worthless. Large tracts of it were allowed to revert to the states for taxes and thousands of acres were later acquired for a few cents an acre by speculators who thought the land had some possibilities. Later on as population increased and land came into greater demand it was found that much of this cut-over pine land was capable of producing profitable crops. A large number of instances could be cited where land which was secured for paying the taxes was sold within ten or fifteen years for from \$15 to \$30 per acre. The cut-over pine land in these states is still slowly increasing in value and there are thousands of acres which at this time are spoken of as worthless and which can be bought for from \$2 to \$5 per acre. Future knowledge along agricultural lines may make possible the successful development of the poorest of this land. People are flocking to the Northwest and a large number of them are attracted to that region because they expect to make money speculating in land. Desirable tracts have frequently been known to double in value within one or two years and wherever there is a possibility of making money as rapidly as this there are plenty of people who are willing to move into the promising section and invest. The increase in population in this country has been very rapid and as settlement has advanced from the older communities into the new, land values have increased with development. Those who have purchased just in advance of settlement and have held possession until the section was fairly well developed have made plenty of money. The marked success of the few attracts the attention of many and few of those whose attention is drawn to the new

country inquire closely into the possibility of failure, hence we see thousands of people seeking for homes and places to invest which give the greatest promise for rapid development. It frequently occurs that changes are made when it would have been better for those interested to have remained at home. Some of the means used to induce people to make a change will be taken up later on in this volume.

CHAPTER II.

HOW DECISIONS TO CHANGE LOCATION ARE OFTEN MADE.

A number of reasons for desiring a change of location were enumerated in the preceding chapter but these reasons in themselves are not always sufficient to bring about a definite decision in the minds of those most deeply interested. There may be a great many reasons for desiring to leave a certain locality but it may be extremely difficult to take the final step because there are so many new sections of country which invite the prospective settler and it is difficult to decide which is best adapted to the peculiar needs of the individual, or which offers the most attractive propositions. Almost every state has certain advantages along some particular lines which are not so fully enjoyed by a neighbor state, and nearly all sections of the country and especially the newly developing regions, are putting forth every effort possible to impress their most desirable features upon the minds of all who contemplate making a change sooner or later. These efforts are often so strongly presented that of themselves they may create a desire for people to leave their home community and try for a fortune in the new locality.

Transportation facilities are afforded practically all portions of the country and in any community there are usually some who have traveled to a greater or less extent. From these individuals as centers information concerning the regions visited soon spreads throughout the neighborhood. This knowledge received second hand, as it is, may create a deep interest in certain sections and some may be influenced to make a change upon the recommendations of a friend. The reports of many who visit California are so very enthusiastic that the majority of people who go there are induced to do so by personal friends. Some are always disappointed because they expect too much

and also because they do not see things in the same light or under the same conditions as their informer saw them.

Large numbers of people annually decide to change their location through the results of personal investigations which they have made, and it may be said that this is always the most satisfactory for all concerned. Homeseekers' excursions are now a feature which all railway lines of any extent attempt to encourage. The cheap rates offered permit people of limited means to visit newly developing regions and this makes possible a personal investigation of the opportunities. The magnitude of this business can hardly be realized unless one has taken part in an excursion of this kind or has been brought in contact with them in some way. The writer spent a winter in Texas a few years ago and was stationed in a small town on one of the main lines of traffic. Hardly a day went by during which at least one train load of homeseekers did not pass and on several days as high as seven trains of from eight to twelve coaches each, all loaded with homeseekers, passed through the town. These excursions are so arranged that one may stop off at any point desired or at a number of places and remain for a considerable length of time. They are in charge of well informed representatives of the railroad companies who supply information concerning the country traversed.

Where it is impossible for people to make personal investigations of the opportunities offered in any region it is sometimes found advantageous for those interested to contribute toward the expenses of one of their number who may be selected to take the trip. This representative may visit a number of places and the report which is made upon his return will be the determining factor in deciding to which section they shall all go. It may be that after such an investigation is made some will conclude that they will be better off to remain at home. If such is the case it usually follows that the feeling of unrest with which they were possessed is no longer manifest and they are then

content to remain in the old community and assist in bringing it to a higher stage of development.

Another factor which is very influential in calling the attention of people to newly developing sections and which, without doubt, stimulates the desire for a change of location to a greater extent than any other one thing, is the great campaign of advertising inaugurated by real estate firms and the promoters of large colonization propositions. The country is flooded every year with advertisements in magazines, newspapers, posters and in pamphlet form which bring to the attention of the public the wonderful opportunities which await settlers in the "land of promise." It is safe to say that the information circulated in this way is among the most optimistic literature in existence at the present time. It is the object of all this advertising to place the advantages of the section in question before the prospective investor in the most favorable light possible. It is intended to make an impression so strong that it will finally lead those interested to make a personal investigation and invest or to invest without making any investigation as to the merits of the claims made. Advertising has developed wonderfully during the past decade and it may be considered a fine art. The methods employed have been adopted only after careful study of the most minute details; even the style of type is given careful consideration so that the attention may be attracted and held by the advertisement. There are at the present time a number of schools throughout the country which make a specialty of teaching advertising, and there are many business firms which pay specialists at the head of their advertising departments salaries as high as \$20,000 per year. It will thus be seen that advertising is considered a very important factor in any business enterprise. One object is to inform the public where and how demands for various things can best be supplied. Another object is to create a demand for the things which an individual or company may wish to place upon the market.

It is thoroughly recognized that advertising is a very neces-

sary and important branch of trade and it is not the intention to discredit in the least this highly developed industry. It is the intention, however, to place before the public the fact that the methods employed by some real estate promoters are often the cause of misleading a great many people by inducing them to put all of their saving into property which they have given a greatly inflated value and which cannot be successfully developed by the average person along the lines indicated in the claims made. Florida lands have probably been advertised more extensively throughout the northeastern and north central states than lands of any other region. The possibilities of this state have been so vividly painted that thousands of people have bought small tracts without ever going to examine the land. When they have moved their belongings to the "land of promise" expecting to make their home and a fortune on ten acres, under the bright sunny skies, they have found their land to consist of nothing but sand which it will cost more to improve and make productive than the original cost of the land and which can be handled successfully only by expensive methods. Very few are sufficiently acquainted with the methods of soil management to be capable of bringing such land to a high stage of productivity. There are many excellent opportunities in Florida as there are in all of the southern states, but there is a great deal of very poor land mixed with the good. It is the object of most of the real estate dealers to sell as many acres as possible. Sometimes the dealer knows the land is poor and sometimes his knowledge of soil conditions is as limited as that of his prospective customers. As will be found out from the discussion of Florida later in this volume there is a great amount of deep sand in that state which is very poor land. Much of the best land is sandy on the surface and the subsoil is the determining factor. It is very easy to be misled and therefore the greatest care should be exercised in selecting a farm in that region. Many who take up land there know nothing about farming and what efforts they make are poorly directed. As a result

many become discouraged, give up the place and return home, providing they have sufficient money left, much poorer from a financial point of view but considerable richer in experience. Advertising matter which makes such unwarranted claims for any region should not be permitted to circulate. This class of advertising does a region more harm than good and it establishes a prejudice against all real estate dealers.

In any newly developing field the real estate men are very conspicuous and as in other lines of business all classes are to be found. Many have an untarnished reputation and are always fair and square in their dealings and conservative in their advertising. The older established firms are more often apt to be of this sort, though in a new section it necessarily follows that none of the lines of business can be very old. Old established firms, however, frequently install branch offices in new territory. Many young men start in the real estate business in new sections and among these are found many straightforward, honest hustlers who can be trusted implicitly. The broker who is transient, remaining in one locality only a short time, fleecing whom he may and then seeking for others in more remote regions, is to be avoided. There are exceptions, of course, in all classes and the only safe way is to be sure of the reputation of the man with whom a deal is to be made. A man of honor will not unite himself with a questionable business and therefore if any proposition is in the hands of a reputable person one may be reasonably sure of getting a square deal.

There is one rule, however, which should always be followed in buying land or any form of real estate and that is—*Never buy until the property has first been carefully inspected.* P. T. Barnum said the American people liked to be humbugged and also that there was a sucker born every minute. It seems that the unscrupulous real estate dealer is as willing as any one else to take the money from the blind man. It may be said that if people are willing to buy land without first seeing it they should not complain if they get the worst of the bargain. The

important rule, of course, is broken when this is done, yet it must be remembered that there are thousands of people who sincerely want a small farm and a home in the country. They have only limited means and often do not feel able to make a trip of investigation and then return and move the family. They often figure that it would be an unnecessary expense since they place confidence in the representation made to them by the real estate dealer's advertisements.

Too great care cannot be exercised even when a personal investigation is being made. The attention of the writer was recently called to a transfer of several thousands acres of land in one of the southern states. The agent took the prospective buyer over a tract in an automobile, pointed out the corner posts, good natural drainage, rich soil, etc., and the sale was promptly made on a cash basis. When the surveyors came to plat out the tract for the new owner it was discovered that the land was adjoining that which had been examined and instead of being high and well drained it was a swamp and practically worthless. It was a transient broker who put through the deal without the owner of the property knowing that any misrepresentation was made, and when the fraud was discovered the broker had made his departure for regions unknown. Such instances as this are exceptional, yet they emphasize the necessity of exercising the greatest caution.

CHAPTER III.

HOW TO SELECT A FARM.

When it is fully decided that a change in location is to be made and that the new home will be established on a farm, the next important question to be solved is the selection of the farm. This is no small matter, especially if one's knowledge of soil and agricultural conditions are limited, as is often the case with people who have always lived in the city. Whenever it is possible to do so, those of limited acquaintance with such matters should enlist the assistance of some experienced friend who will either accompany them on the trip or at least give practical suggestions. A number of books have been written on this subject and many valuable points can be gained by reading such works. The assistance of a practical business farmer, however, will be found to be the most satisfactory and it would be advisable to pay considerable for the services of such a man for the time required in making the selection. Of course, there are many instances where the prospective buyer will have to rely upon his own judgment whether he is experienced or not. We therefore desire to call attention to some of the most important things which should be considered when a farm is to be selected.

It may be necessary to visit several different localities before one is found in which the general conditions appear to be the most favorable for the establishing of the home. Whenever it is possible to do so it is advisable to cover a wide range of country before settling on any particular region. In this way first hand information will be secured concerning a number of different sections and when a selection is finally made, satisfaction and contentment will be more apt to follow. If only one section were visited and the results of the first year did not prove to be very encouraging one might feel that he could have done better in some other locality. The possibilities of discontentment

arising will therefore be reduced to the minimum if at least several of the most promising sections of country are examined before a selection is finally made.

Before any particular tract of land is chosen as the site for the future home it should be definitely decided as to the type of agriculture that is to be followed, for this will have considerable to do with the character of the soil which should be selected. For example, if truck crops are to be grown it would not be advisable to select a farm on which the soils consisted of clay or clay loams. On the other hand, if dairying was to be carried on it would not be desirable to select light sandy soils. Certain crops thrive best on certain types of soil and, therefore, if one has decided what crops are to be grown he should select a farm having the soils which will produce these crops to the best possible advantage. By following the suggestions in the chapter on "How Uncle Sam Can Help" very valuable and helpful information concerning soils and their adaptation to crops can be readily secured.

As nearly all tracts of land, farms and lots which are for sale are listed with real estate dealers, it is usually necessary to transact business through some such agency. It is customary for an agent to show prospective buyers over the farms which it is thought will answer the needs of the investor. It is the object of the real estate man, of course, to make a sale whenever possible and all of the most desirable features of any tract will be clearly pointed out and emphasized. One should not permit this tendency on the part of the salesman to delay or sidetrack investigations along all lines. After a number of tracts have been examined and some of them seem to be quite desirable, the prospective buyer should make it a point to visit these places at another time when he is not accompanied by the agent. This will permit a more thorough investigation and during such an inspection one should go over every portion of the farm carefully. The soil should be examined carefully with a three foot auger and notes made for comparison on the variation of the

soils of the different tracts. The drainage conditions should be carefully looked into and possible sites for buildings should be inspected. The condition of the fences and other improvements which have already been made should be examined and whenever it is possible to secure it, a history of the farm and farm practices followed should be obtained. If the land has been under cultivation for some time this will be of especial value, for if the soil has been abused by raising one crop on the same field year after year and if nothing has been returned to the land in the form of fertilizers, it is well to find this out, for it is a very important matter. Two adjoining farms may have the same kind of soil and yet produce different yields because one may be in a much better state of cultivation and fertility than the other. It may take several years of good farming to bring the one farm to a state of productivity equal to the other and therefore, the two places have a different value. The possible water supply for household purposes and for stock should be investigated. It is often desirable to go over a place a third time so as to be absolutely sure of all details. After the second inspection has been made and careful thought has been given the matter, other points may arise which will require attention. Never get in a hurry while selecting a farm. Don't let the uneasiness of the real estate man cause any worry. Take all the time that is necessary, for when the place is once purchased it may be the home for years to come.

There are a number of things to consider outside of the farm itself and perhaps the most important of these is the social conditions of the community in which the farm is located. If it is in a section of country just opened to settlement and only thinly populated, there will not be much to investigate along this line except as one may inquire into what class of people are becoming interested in that particular region. A visit to some of the homes already established will be to advantage. One may thus gain some idea as to the social conditions which may develop as the population increases. It is much more difficult for the women

of the household to become accustomed to new conditions than for the men and consideration should always be given this fact. The proximity of churches and schools should be ascertained and inquiries made as to the thoroughness of the instruction given, especially if there are children of school age in the family.

The distance from the farm to markets is a very important matter. If a city trade is to be supplied with truck or dairy products it is important that the farm should be within easy hauling distance of the city. If the produce from the farm is to be shipped to distant markets it is then desirable that the location should be near a good shipping point. The shipping facilities and rates afforded by the railroads nearest should be investigated. The rates on getting produce to distant markets are often very high and sometimes eat up the profits in production. The matter of good roads also comes up at this time and it is an important question, for the better the roads are the cheaper the produce can be marketed.

Climatic conditions and the general healthfulness of the region should be taken into consideration. The amount of rainfall and its distribution throughout the year is an important point. If the rainfall is limited as it is in many portions of the west and southwest, irrigation will be necessary and where this is the case it frequently happens that there is sufficient alkali in the soil to be injurious to plant growth. Very reliable data as to the climate, rainfall, and conditions of the soil in various parts of the United States can be readily secured from the various departments of the Government, as pointed out elsewhere in this volume.

When a farm has finally been found which proves to be satisfactory, negotiations may be entered into for its purchase. It is usually customary to enter into a contract with the owner of the property or with the real estate agent, if he has been authorized to act fully for the owner. The purchaser is required to deposit a nominal sum to show his good faith and the owner of the property furnishes an abstract of title to the farm. The

contract should stipulate that one condition of the sale is that the title shall be perfect. If it does not prove to be so the money deposited will be refunded and the purchaser released from the contract, or the title perfected. When the owner submits the abstract the prospective buyer should have it examined by an attorney and his signed opinion attached to it. If the title is perfect the deal may be closed. The abstract should be preserved so that if it is desired to sell the property at any time the expense of having another prepared may be saved. It can be brought up to date by the addition of the last transfer of the property.

In case a person should be fairly well pleased with a tract of land but should not wish to close a deal for its purchase, it is often possible to secure an option for a small consideration. This may be for a period of a few days or it may be for a year. Under the terms of an option the prospective purchaser is usually given the first opportunity to close the deal under conditions which may be agreed upon. During the period over which the option extends the prospective settler has an opportunity of examining the place more carefully, and he may also examine other places, which may prove to be better suited to his needs.

After a deal is closed and the deed is to be delivered it is well to have the deed examined by an attorney so that there will be no possibility of error. After the deed has been delivered to the purchaser he should have it recorded by the register of deeds in the county where the land is located.

It may be that the one desiring a change of location will not wish to buy land but will desire to take up a homestead directly from the Government. It may be said that at the present time there is no government land that is desirable for homesteading east of the Mississippi River. All of the western and southwestern states contain a large acreage which is still open to homestead entry but, of course, each year the amount of this land which is desirable is being rapidly reduced. The public land in the state of Texas is under the control of the state authorities

and inquiries concerning that region should be directed to the Commissioner of Public Lands, Austin, Texas. The public lands in all other states and territories are under the jurisdiction of the United States Government and any desired information may be secured by writing to the Public Land Office, Department of the Interior, Washington, D. C. Information will be given as to the location of all public lands open to homestead entry and instructions will be given as to how entry should be made for such land.

CHAPTER IV.

HOW UNCLE SAM CAN HELP.

When the question of selecting a farm is under consideration there are always a number of things which should be taken into account, because the change to be made will be of great consequence to those interested. It frequently happens that too little attention is given to securing good and reliable information concerning the different localities from which a selection is to be made. Reliance is often placed on the literature circulated so freely through the country by real estate dealers and promoters of large colonization propositions. The information contained in such literature is usually based on facts but these are frequently distorted, and the reports are biased because it is the object of the advertising matter to get people interested in the advertised section. Only the most desirable features are taken up and the yields of the various crops are the most optimistic, being based too often on the maximum returns for the most favorable years. If there are serious drawbacks they are not mentioned at all or referred to as being of slight importance. Perhaps the statement may be made that the things which appear to be undesirable will in reality prove to be beneficial. The most extravagant statements are sometimes made and it frequently seems incredible that anyone would attempt to pawn off on the public such unreliable information.

As a result of the publication of such a vast amount of unreliable data many people, being satisfied with this class of information, are induced to make a change, whereas if the true conditions had been known the proposition would not have appeared at all attractive. If only trustworthy reports were circulated concerning the various newly developing sections of country, much dissatisfaction would be prevented, large amounts

of money would be saved to those who are most sadly in need of it, and the communities affected would be much better off. In the light of such facts it is very important that those contemplating making a change should make themselves familiar with all possible information available bearing upon the localities which they are considering, and not be guided by the alluring advertisements of the land speculators.

There are a number of reliable sources of information which supply data along the various lines under question, and the one upon which it is always advisable to call is the United States Government. The branch which will be of the most service to those desiring data on soils, crops and general agricultural conditions, climate, etc., is the United States Department of Agriculture at Washington, D. C. This Department is divided into Bureaus, each having particular lines of work and investigation to follow. The Bureau of Soils makes a careful study of the soils and agricultural conditions in various parts of the country and attempts to solve the many problems which arise from the tilling of the soil. The Bureau of Plant Industry confines its work largely to problems relating to the growth of plants where such problems have an important relation to agricultural development. They follow out various lines of plant breeding and experimentation in an effort to improve plants or adapt them to certain conditions. Their field embraces a broad scope of work which is very helpful to the agricultural interests of the country. The Bureau of Animal Industry deals with questions relating to the raising and handling of all classes of livestock; the Bureau of Chemistry with the adulteration of food stuffs, etc.; the Bureau of Entomology with insects which may have an influence on the development of agriculture, and the Weather Bureau which makes a study of the atmospheric conditions throughout the country. Another branch of the government which is of great service to the agriculture development of the country is the Reclamation Service of the United States Geological Survey. Their field is chiefly in the reclamation of arid and semi-arid

regions of the west by means of establishing irrigation systems under government supervision and control. These branches of the government are of great importance to the people as a whole, of more importance than is appreciated, but they are of special service to all desiring specific information concerning any of the numerous lines of investigation taken up. The employees of departments are public servants and it is the mission of all Bureaus to serve the people. If, for example, information were desired regarding the agricultural possibilities of any particular section of country and inquiry should be sent to the Secretary of Agriculture at Washington, D. C., this would be referred to the Bureau working along the particular line and all information available would be forwarded to the party making the inquiry. A slight charge is sometimes made to cover the cost of publication on certain lines of work. The data secured in this way is unbiased and reliable and is, therefore, of much more value than the highly colored, exaggerated advertising matter of the promoter. There should never be any hesitancy, therefore, in calling upon the government for any desired information.

Another source of reliable data along agricultural lines is the Agricultural Experiment Stations throughout the country. There is at least one in every state and territory in the United States and they are doing a magnificent work in the higher development of agriculture and in bringing farm life to a higher plane. The result of the work done at these stations is of special help to the residents of the states in which they are located, but they are also glad to furnish information to residents of other states and will usually send their publications to any address free of charge. It will thus be seen that if a resident of New York wishes some special data concerning the raising of cotton in Mississippi he could write to the director of the Agricultural Experiment Station at Starkville, Mississippi, and secure without cost reports on all of the cotton investigations which have been made in that great cotton growing state. It is need-

less to say that the data thus secured will be of far greater service and much more satisfactory to the New York man than the average booklet sent out by real estate promoters. A list of the various experiment stations of the country and their location is supplied with this volume for the convenience of those wishing to make inquiries at any time.

The railroads of the country and especially those which traverse newly developing country publish a great deal of literature on the resources of the region along their lines and commercial clubs, business men's organizations and chambers of commerce afford sources of information which are worthy of careful consideration. It is the object of these organizations to settle up the country with people who will be satisfied to remain and make permanent improvements and enter into the life of the community. The representations which are made to the public through these channels are usually very fair and reliable. They furnish data not only along agricultural lines but also along all lines of business enterprise.

The branch of the public service which is in the best position to furnish the information desired by prospective homeseekers is without doubt the Bureau of Soils of the U. S. Department of Agriculture, and a description is given herewith of the character of the work which is done and the manner in which this can be made use of by those interested in any particular region.

The Bureau of Soils was organized for the express purpose of making such investigations along the lines of soils and their adaptation to crops as would be of the most practical nature possible. The work taken up has met with great success and the Bureau has grown from a small Division under the Weather Bureau employing only three or four persons, to a separate Bureau employing over 100 experts, scientists and clerks. About one-half of the force is kept constantly in the field while the other half remain in Washington for the purpose of performing the laboratory work and making special scientific investigations with samples of soil from various parts of the country.

The work done by the men in the field is of the most practical nature and of great assistance to all interested in agriculture. The work which is done consists of making a soil survey of the different sections and the unit for such a survey is usually a county. Up to the present time soil surveys have been made in every state and territory of the United States, excepting Alaska. To those unfamiliar with work of this nature there are always three questions which naturally arise when the matter is brought up. The first question is: What is a soil survey; the second: How is a soil survey made; and third: Of what particular value is a soil survey of any region.

A soil survey consists of making a classification of the soil in the fields and in preparing a map which shows where all of the different kinds of soil are located. The classification is based largely on the texture of the soil grains, though the topography, geological derivation, structure, drainage of the soil, natural growth and the climatic conditions prevailing are all taken into consideration and given weight in establishing the different soil types and soil series. As is well known the soils of any region vary to a considerable extent. There may be clay, silt, loam, sandy loam and sand all within an area of limited extent. It is the work of the soil survey to find out the extent and the exact location of all of the different classes of soil, to make a study of the methods of cultivation and fertilization which have been practiced, to determine as far as possible the best methods of culture to be followed and the crops and the rotations best adapted to each particular soil. The map which is prepared is called a soil map and the report which gives a detailed description of each soil, its adaption to crops, methods of culture, general information concerning transportation facilities, labor, markets, etc., covering the area surveyed is called a soil survey report.

As stated above, the county is usually taken as the unit for soil survey work and whenever a reliable county map can be secured this is used as a base. When such a map cannot be

secured it is necessary for the men to construct a complete base map, using the ordinary planetable for doing the traverse work, and getting the measurements on the roads by means of an odometer attached to the buggy wheel. Two men usually work together. The soil is examined by means of an inch and a half auger and borings are taken to the depth of three feet. In starting the work in a certain area the first boring may show, for example, that the soil consists of a medium textured, brown loam ten inches deep, underlain by a heavy loam grading into a yellowish-brown gritty clay loam and extending to a depth of over three feet. If the area is within the glaciated region and the material composing the soil consists largely of limestone particles, from having been scraped over limestone formations by glacial action, this particular soil will be classed as Miami loam. The term Miami is used then in connection with this soil wherever found. On making other borings in the immediate vicinity it may be found that this same soil covers a considerable area. They then select a certain color, from the supply of colored pencils with which they are provided, and indicate on the map by this color the area over which the soil occurs. This one soil constitutes what is called a soil type. The men proceed with their work and probably soon come to a place where the soil consists of a brown, medium sandy loam twelve inches deep, underlain by a yellowish-brown sticky sandy loam or sandy clay extending to a depth of over three feet. Since this soil will have a somewhat different agricultural value and is different in texture than the other soil it constitutes a new soil type. It will work easier and may not retain moisture as well as the loam type. If it is of the same origin as the loam soil it will be called Miami sandy loam, which indicates that it is a separate type but belongs to the same series. The soil series corresponds to the family and is made up of a number of individuals all having the same origin and having many characteristics in common but differing mainly in texture and the consequent agricultural value. Thus in any soil series we find types ranging in texture from clay to

coarse sand. When a new type is discovered in the field a new color is selected for it. It then becomes necessary to trace out the boundary line between the types and indicate this accurately on the soil map. Thus the work progresses from day to day until the county is completed. While the mapping is in progress a careful study is made of the methods of farming followed on the different kinds of soil and notes are taken on the yields, etc. The mapping can usually be done at the rate of from four to eight square miles per day, depending upon the uniformity of the soil, condition of the roads, weather, etc. When the field work is completed a copy of the map is made on the scale of one inch to one mile and a complete report written covering the soil and agricultural conditions in that region. The map and report are then forwarded to Washington where they are published.

In any one county there may be from five to thirty distinct soil types representing several different series. When the different series are found to have certain characteristics in common they are said to belong to the same soil province, and this is the broadest division which is made in soil classification. The whole United States is divided into a number of soil provinces. For example we have the Atlantic and Gulf Coastal Plain Province which extends along the coast from New Jersey to South Texas and comprises the coastal plain country which was covered at one time by the ocean and during which time formations giving rise to the different soils were deposited. Within this extensive province there are a number of series of which the Orangeburg and the Norfolk are the two most important. In the Appalachian Mountain region we find the Piedmont Plateau Province comprising a number of series, including the Cecil, which is derived from the weathering of igneous and metamorphic rocks. Another province includes the Limestone Valleys and Uplands, another the River Flood Plains, another the Glacial Lake and River Terraces and still another the Glacial and Loessial region. Within this last province we find the Miami, Coloma, Plainfield, Waukesha and a number of other

series, which have been influenced to a greater or less extent by glacial action.

As the field work progresses from one area to another throughout the country, samples of all the different soil types are collected and sent to Washington. A mechanical analysis is made of each sample and in some cases a chemical analysis is also made. A careful microscopic examination is often made of the soil grains to determine the different minerals which go to make up the soil.

The work of the soil survey which is conducted in some of the arid and semi-arid states and also in some of the portions of the country poorly suited to the development of agriculture, is of a different nature than the detailed work just described. The conditions, as a rule, are much more uniform and possibilities for future development in many cases are more remote. The survey in such localities is called a Reconnoissance Survey because of the fact that it is very general in character. The work is done on a scale of one inch to six miles and only the broader soil relationships are recognized. Distinct soil types are mapped but the type there is often permitted to include a wider range of variations than is the case in the detailed surveys.

Wherever there is the presence of alkali in the soils of the arid and semi-arid sections and a detailed soil survey is made of such an area, an alkali map is also constructed, showing the amount of alkali which is contained in the soils throughout the region surveyed. This is of great importance, for it frequently happens that the soil contains sufficient alkali to be very injurious to plant growth. Sometimes it is so plentiful that nothing whatever will grow, while in other places the amount is small and may make the growing of only a few crops impossible. Some crops will stand more alkali than others. The practicability of installing irrigation systems is sometimes determined by a soil survey.

When it is realized that there are almost an infinite number

of variations in the soil throughout the country and that frequently only a slight difference in the texture of a soil and its various properties may influence the growth of certain crops to a marked extent, it will be seen that the making of a soil survey and the proper classification of all of these variations is a mammoth undertaking. The men employed in this great work are chiefly from the farm. They have taken courses in the leading Agricultural Colleges of the country and aside from their practical knowledge of agricultural matters they have acquired, through special study, accurate knowledge of the soil and its functions from a scientific, as well as a practical standpoint. These men are experts and the experience which they have and which they are acquiring as the work progresses, makes them of great value to the agricultural interests of the nation.

The real value of a soil survey can hardly be overestimated. In the first place it constitutes what might be called an inventory of the soil and agricultural resources of the region covered. In any line of business it is necessary to know what the resources of the concern are before it is safe to launch any business campaign. So it is also necessary to have a definite and accurate knowledge of the soil before the agriculture of any region can be most successfully and highly developed. The soil survey should form the basis for all future soil work which may be carried on by the nation, the state or the individual. To the resident of the county in which the survey is made it gives an accurate account of the soil conditions existing throughout that area. It gives ideas as to the best methods of cultivation, fertilization, crop rotations which should be followed on the various types of soil and it frequently paves the way for the introduction of new crops which may be better adapted to the soils than the crops commonly grown. To the man living outside of the area surveyed, perhaps in some distant state, it gives reliable information concerning all soil and agricultural matters which he should know in case he may con-

template moving into the region surveyed. Where surveys have been made in newly developing sections the soil maps and reports are of untold value to all prospective settlers. They furnish detailed information regarding particular localities which could not be obtained from any other sources. If, for example, a person were contemplating the purchase of a farm in Baldwin County, Alabama, and had received only the publications of the real estate dealers who are interested in that section, he would naturally desire, or he should desire, information from other and more reliable sources. By writing to the Chief, Bureau of Soils, Washington, D. C., he could secure a soil map and report of Baldwin County free of charge. This map shows the character of soil on every section of land, all roads, schools, churches, towns, railroads and streams and the report gives a careful, unbiased description of the various soils, the extent to which they are improved and the crops to which they are best adapted. It gives an account of the labor conditions within the area, transportation facilities, public roads, markets and the extent to which various parts of the county are developed. It gives the average price of land on the different soils and furnishes as a whole a vast fund of reliable information which could not possibly be duplicated in several years' time by the average man making a personal investigation.

It is not advocated that these reports should be used for the purpose of selecting land without first seeing it, for the selection of land in this way is never advisable. If, however, one should be called upon to make a decision concerning land in a certain locality these reports and maps should be consulted for they furnish reliable data which cannot be secured in any other way.

Soil survey work has been done in every state and territory in the United States and a number of the states are now co-operating with the Bureau of Soils for the purpose of completing the survey of these particular states in the least possible

time. As the work is done largely by counties and as the soil mapping has been in progress for over twelve years it will be realized that there has been accumulated a vast fund of valuable data concerning the soil and agricultural resources of the country. While it is not possible to secure soil survey reports of every county in any state it is possible to get reports and maps from all the chief agricultural divisions of the country. From these very valuable general information can be secured which is applicable to much of the country adjoining the region surveyed and which is specific for the area actually covered.

It is urged that a more extensive use be made of the soil survey reports, especially by those who contemplate buying a farm, either large or small, in some section of the country with which they are not familiar. Get a soil survey report of the county to which you think of going, or of a county near by and read it over carefully. Examine the map and study the soil type descriptions and the general conditions which are reported to prevail there. If conditions seem favorable one may then go and select a farm. If conditions do not appear favorable and if it is still desired to make a change it would be advisable to get reports covering other sections. Soil survey reports and map may be secured free of cost by writing to the Chief, Bureau of Soils, Washington, D. C. Any information desired concerning irrigation projects may be secured from the Reclamation Service, U. S. Geological Survey, Washington, D. C. The congressman from one's home district may also be called upon for any of these reports.

CHAPTER V.

HOW A CITY FAMILY SUCCESSFULLY MANAGED A FARM.*

INTRODUCTION.

This chapter is a record of the experience of a city family that moved onto a farm in 1892. The father had been a lawyer by profession, the manager for a well-established business firm in one of the principal cities of the Middle West, and was earning a salary of \$3,000 a year. At sixty years of age, having been in business about twenty-five years, he was compelled on account of ill health to abandon his profession and business. There were ten children in the family, ranging from two to twenty-one years of age, of whom seven were boys.

Under these conditions, with available capital amounting to about \$10,000, which had been partly saved in business and partly received by inheritance, the family decided to buy a farm and attempt to solve the problem confronting them, namely, "to make a living, educate the children, and make a pleasant home." This chapter will tell how they satisfactorily solved the problem, and while this is not a story of typical farm life, it shows what courage, energy, business ability, and moderate capital may accomplish on a farm. The fact that this farmer has been successful without previous experience or special training, following systematically the ordinary cropping system and methods of tillage, with the exercise of good judgment, shows that the chances for success in farming are as good as in most business enterprises.

An attempt will be made to present such facts about this

* This chapter has been taken from Farmers' Bulletin No. 432 of the Bureau of Plant Industry, U. S. Department of Agriculture.

farm as will enable the reader to comprehend under what conditions and by what means the results were accomplished; hence, a description of the farm and the methods of operating it will be given in some detail. It is not intended to indicate in this description ideal methods of farming. As a model of farm management from the standpoint of maintaining soil fertility and thus obtaining large crop yields this chapter will have no special interest. The methods of keeping accounts suggested in the tables have been the instruments through which this farmer has kept track of his business, but they are not given as model forms. The description given is rather for the purpose of enabling the reader to get the point of view and spirit of the family in meeting the problems of life and realizing their ideals on a farm.

It is believed that this farmer has, by his experience, answered the chief objections to farming as an occupation and to a farm as a place for establishing an ideal home. These objections, as usually stated, are that farming is not as remunerative as other occupations for the same ability and effort expended, that the family is deprived of desirable educational and social opportunities, and that the labor is too hard and uninspiring, especially for the women. The record will also show how some important social, economic, and technical farm problems have been worked out; for instance, the farm-labor problem, the household problem, the training of children in responsibility in management, and the doing of farm work in a way to meet the requirement of a normal social life and of cultivated intellectual tastes. It is also believed that a narrative of American farm life, such as this, will demonstrate not only the possibilities but the desirability and dignity of farming as an occupation.

While the owner of the farm wishes to avoid publicity, he is willing that the results of his experience be made known in order that other city men may feel safe in attempting to support and educate their families in this manner.

A diary and a financial record were kept on this farm for a period of seventeen years. The facts here given are based upon these records.

DESCRIPTION OF THE FARM.

When the family began country life in 1892 the farm consisted of 300 acres * in a much run-down condition. It was an old farm, having been located and surveyed about the middle of the eighteenth century. The old house, which had been built about 100 years ago, was still substantial. In a remodeled form it is now the kitchen of a modern house. Much of the land had been allowed to grow up in bushes and young trees. The barns and fences were out of repair, so that the place as a whole presented a dilapidated appearance. The farm had been rented out and had produced a gross income of about \$700 a year.

The location is in the beautiful and fertile region known as the Shenandoah Valley, the middle section of the great Appalachian Valley which extends from the northeast corner of Pennsylvania to central Alabama. It is about 100 miles from a seaboard city and is accessible to railways leading to New York and to the large cities of the Ohio and Mississippi valleys. In this section there are now good turnpike roads. One of these passes the farm and leads to a shipping point three miles distant and to the county town of 3,500 inhabitants, three and one-half miles distant.

The soil here is residual, formed from a limestone of the Cambro-Silurian age, having a rich brown color and, according to the classification adopted by the Bureau of Soils of the Department of Agriculture, is a clay loam of the Hagerstown series.

* About eighty acres were added to the farm a few years later, making the entire farm consist of 380 acres.

CAPITAL AND OTHER RESOURCES.

The inventory taken January 1, 1892 (see Table I), showed that the land with improvements was valued at \$55 an acre. the whole farm and equipment being worth \$19,707. The debt on the farm, \$8,459, and money borrowed for fertilizer, \$220, made the total liabilities \$8,679, which, deducted from the above assets, left a balance of \$11,028, which constituted the "present worth" of farm and equipment at that date.

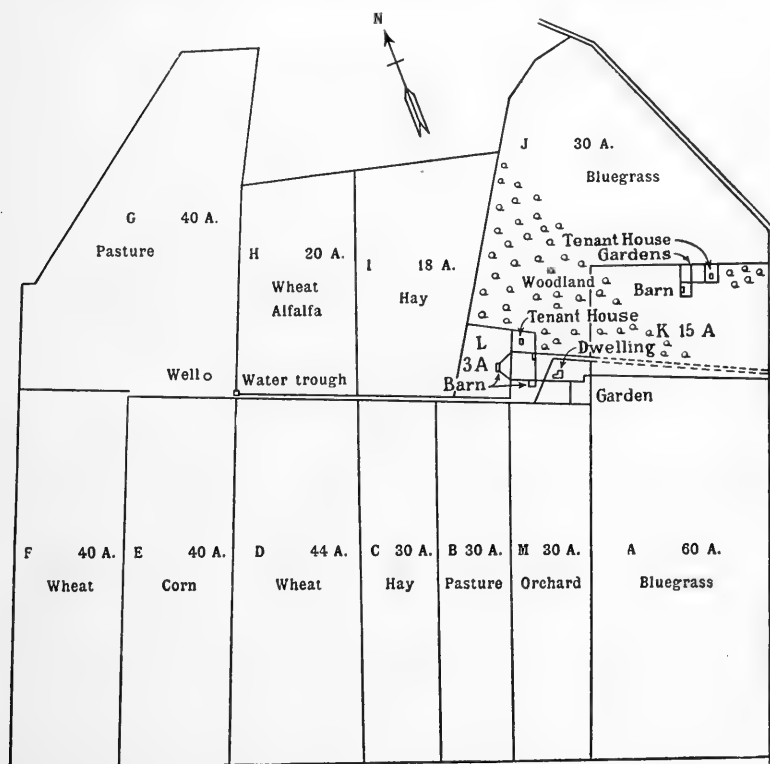


FIG. 1.—Plan of the farm, showing the arrangement of fields, buildings, etc.

ARRANGEMENT OF THE FIELDS.

The general management of the farm seems to have been well thought out from the first. The farm was laid out originally about as it appears at present, and with slight changes to fit conditions the cropping system was the same as now. The plan of the farm (fig. 1) shows the convenient arrangement of the fields.

Special attention was given to laying out the farm. All the fields except F may be reached within 650 yards of the barnyard. Field F is within half a mile. The fields are as long as can be arranged in accordance with the general farm plan. This is regarded as an important feature in the arrangement, since the time saved during the year in turning corners when plowing and in doing other farm operations is considerable. The gate to each field is placed at the corner nearest the barn, and workmen are required to leave implements at the gate when coming in from the fields. The lane leading to the fields is thirty feet wide; except for the wagon track it is grown up in bluegrass, so there is practically no waste on its account. A well, eighty feet deep, located in field G, supplies water by windmill to a cement trough, which is so placed that it furnishes water in two fields and may be reached easily through the lane from other fields.

CROPPING SYSTEM.

The general crop history of each field may be worked out from the following system of rotation: Corn, wheat, wheat, grass for hay, pasture, corn. Usually two wheat crops follow in succession, and now and then if the stand of grass is not good it is plowed up, put into corn, and reseeded the next year to wheat. On the plat (fig. 1) are shown the crops raised on each field in 1908-9, the plan for the rotation of fields during 1910 being as follows: B, pasture; C, corn; D, hay; E, wheat; F, Wheat; G, pasture; H, wheat; and I, pasture. This will give the following acreage of crops: Wheat, ninety-five acres; corn, forty

acres; hay, forty-nine acres, including alfalfa; pasture, seventy-eight acres, besides the permanent pasture.

There are thus 262 acres which have been farmed in the five or six year rotation for nearly seventeen years. During this time the division of crops, which have been run in rotation, has been on the average as follows: Corn, forty-seven acres; wheat, eighty acres; and hay and pasture, about 135 acres. It is to be added, however, that field M, which is now in orchard, was put in some field crop up to the time the trees were six or seven years old. The bearing orchard, fifteen acres, is now fourteen years old and the remainder, fifteen acres, is in one and two year old trees. The young orchard is in corn, making the total acreage of corn fifty-five acres.

On field H, five acres of alfalfa were sown in the fall of 1908. The alfalfa was not able to crowd out weeds, especially the sorrel, which for a time threatened to take the crop. During the spring and summer of 1900 the field was disked twice and harrowed two or three times with a spring-tooth harrow, and in September a heavy coating of lime was applied as a top dressing. On September 23, 1909, the alfalfa was vigorous and the indications were that it would continue to thrive.

WATER SUPPLY AND SEWERAGE.

The barn lots, dwelling, and permanent pasture fields are supplied from a well near the premises. By means of a steam engine the water is lifted into a tank and distributed through pipes where needed. The dwelling is equipped with modern conveniences, such as bathroom, water-closet, lavatories, and hot water. The sewage is distributed through tiles in the orchard. The entire system was planned by the owner and the work was done by labor on the farm.

BUILDINGS.

The buildings have been constructed from the point of view of economy in expense and convenience in use. There are good,

substantial horse and cow barns. Their location has been planned in accordance with principles of economy in getting to the fields on the farm. The cow barn and lots are so placed that all the fields may be reached directly. Stock can not interfere with other buildings and premises. Horses may be taken to the fields by opening one gate. The wagon shed is so constructed that the teams are simply driven through the shed and the wagons left standing in their proper places. No labor and time are consumed in pulling or pushing the wagons into place.

LABOR.

The System of Employment.

The farm laborers, who are hired by the year, have families, and live in houses built especially for their use. Reference to the farm plan will show their location. One acre of ground goes with each of the houses for a family garden. Barn room and the necessary outbuildings for stock belonging to the laborers are also furnished.

The plan of housing laborers in separate quarters is followed, first, to secure privacy and freedom in the home and to relieve the household from extra labor. Second, experience shows that it is possible to secure better service by having men with families. This plan has been followed with but few exceptions from the first and has been quite satisfactory to the family and to the men. As a rule these men have been recruited from factories, railroads, and mines. They are secured by offering inducements not usually given on farms. Ten hours of labor, for instance, is all that is required, and usually a part holiday on Saturday. Sometimes a whole day is given as time 'off to work their gardens, etc. Any special service or extra good work is rewarded in some way.

The standard money wages paid is \$200 a year. In addition a dwelling, 1 acre of garden, one cow and pasture, and firewood are furnished. Remuneration beyond this is dependent upon

the quality of service. If satisfactory service has been given during the first year \$25 extra is paid in cash and five barrels of corn to fatten hogs. After two years of satisfactory service \$50 in cash and ten barrels of corn are given at the end of each year. If wheat is put in satisfactorily and the crop is good, thirty bushels of wheat in the mill is added to the income of the laborer's family. The laborer may keep as many fowls as he chooses, inclosed. He has the same area of garden as his employer's family and may sell as much as he likes from it.

This plan has enabled the majority of the laborers who have lived on this farm to accumulate a sufficient amount of capital to take up farming for themselves. Some have become owners of farms. The employer takes pains to teach his men good farming methods.

At least one of the laborers is expected to have sufficient mechanical ability to do all needed repairing and to help with the construction of buildings on the farm. For this purpose there is a well-equipped blacksmith and carpenter shop. This provides work on rainy days and in the winter.

Relation between Owner and Laborer.

The proprietor takes a personal interest in the welfare of the laborer and his family. He holds that good work can not be secured unless the laborer is contented and gives his services cheerfully. Mutual good will develops when the employer is careful in the selection of his men and permits them to share in the general success of the farm. In 1909 the best laborer on the farm, the man longest in service, concluded to begin farming for himself. The employer bought twenty acres of land for him, which will be paid for in small sums, as he can afford to make payments.

Economical Use of Labor.

The economical use of labor is one of the most serious problems in farming. This farmer has plans drawn for the remodel-

ing of buildings, the changing of fences, and the erection of new buildings. "I make these plans as they come into my mind," he says, "and when labor can not be profitably used in the fields it is employed in carrying out these plans. As a rule, I plan ahead for my farm work and find that it pays, since we lose no time and labor can always be profitably employed."

During the winter of 1909-10 a new tenant house was planned by the owner and largely constructed by the regular farm labor, with such other help as could be obtained in the community. The large barn on the farm was built entirely by the men and boys of the family and two laborers.

FAMILY DISCIPLINE AND OCCUPATION.

The occupations and labor of the family are not arranged from the standpoint of economic results, but in accordance with the principles stated in the introduction—that of properly training the children and making the home pleasant.

In the home the children, from the time they were old enough to perform any service, have been required "to do something for the profit or welfare of the family before having any breakfast." The work done by the family in the house was systematized in such a way that each member when old enough assumed responsibility for some of the work. This system of training is adapted to the requirements of farm life. There have been developed on the farm industries such as dairying, poultry keeping, gardening, orcharding, and general farming. At the present time one son makes the apple orchard his specialty. A daughter is responsible for the poultry and another for the marketing of produce and the bookkeeping. The mother does the cooking and superintends the dairy. The father superintends the whole farm, sees that crops are properly put in and cultivated, and that the stock is well cared for. He is in touch with every operation on the farm and inspects all the work that is done.

Special attention is given to the care of the work horses.

Every evening the shoulders of work horses are bathed with cold water. At noon in summer the laborers are given an extra half hour to unharness and reharness the horses. As a result of this special care, sore shoulders on horses are seldom known on this farm.

THE HOUSEWORK PROBLEM.

No regular house servants are kept in the home. The work of housekeeping is done by the mother and two daughters. The laundry work is done outside. All heavy work, and such labor as caring for the garden, etc., is done by the men. The cooking arrangements are planned to economize labor and make it as easy as possible. A hotwater tank is connected with the plumbing system, so that plenty of hot and cold water can be had at any time. This arrangement, combined with a large sink from which waste is carried to the sewer, eliminates most of the conditions which tend to make housework drudgery. Utensils are kept in their proper places, so that they can be reached with the fewest possible steps.

THE FARM GARDEN.

The garden, consisting of about one acre of land, is an important feature in the management of this farm. The crops shown on the diagram (fig. 2) are those planted in 1909. Besides the vegetables and small fruits for family use, the garden brings an income of about \$200 a year, the products being exchanged for groceries. This pays the expenses of the table. The principal money crops from the garden are kale, spinach, winter onions (sold in early spring), tomatoes, and cantaloupes. Kale and spinach are not common crops in this section and a ready market has always been found for them. Others, however, are beginning to raise kale on their own account, so that more spinach is now being raised on this farm. Prices have ranged from forty to sixty cents a bushel for kale and sixty to eighty cents a bushel

for spinach. From 250 to 300 bushels an acre is considered a good crop. Besides being raised for the market, kale is used as a general winter cover crop in the garden.

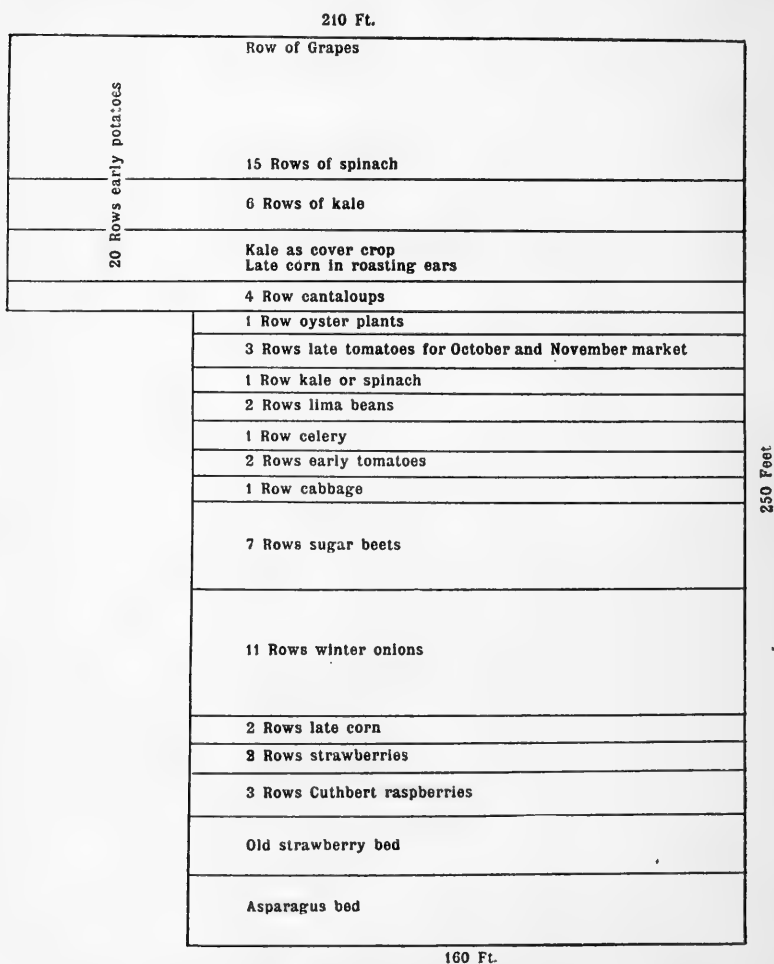


FIG. 2.—Plat of farm garden showing crops grown in 1909.

A specialty has been made of raising late tomatoes to be put on the market when this fruit is scarce. Tomatoes are sold from

this garden about the last of October and in November. Most of the products are sold by telephone to the merchants in the town and villages in the county.

A row of grapes occupies the space along the fence at one end of the garden. There are also four short rows outside, not marked on the diagram. The vines are trimmed in winter, but receive no other special care. When the fruit is formed in early spring the bunches are bagged with two-pound grocery bags, tied securely with a string about the base of the stem. It is stated that these bagged bunches will stay well preserved on the vines until frozen off. The bunches still hanging on the vines unbagged were badly diseased and rotted on September 23.

THE ORCHARD.

Field M (see fig. 1) is now planted in orchard, fifteen acres of which is in the bearing stage. With the exception of a few old trees near the house this orchard is twelve to fourteen years old. The trees were planted in the ordinary manner about thirty feet apart, cultivated in crops for six to ten years, then seeded to grass and clover. At two different times a bushel of wood ashes was put around each tree. This year manure was hauled between the rows and spread about ten feet from the trees. Since it has been in grass the orchard has been pastured by sheep and hogs. The branches are thinned out in the dormant season, being trimmed mostly at the top. The trees are sprayed four times a year, twice for the San Jose scale and twice for the codling moth. There is a space of about half an acre with no trees. The orchard had become infested with the San Jose scale and the infested trees were cut out before the proprietor learned how to deal with this pest.

Reference to the table of receipts and expenditures will show that this orchard has been bringing in a substantial income for three years. Last year 800 barrels of apples were marketed at \$2.10 a barrel. The varieties grown for market are the Ben Davis

and York Imperial. It is planned to increase the size of the orchard until it reaches about 100 acres.

WOODLAND AND PERMANENT PASTURE.

About thirty acres of the farm in one tract is in forest, containing many large and valuable oak, hickory, elm, and walnut trees. The field marked "K," in which are many of these trees, is known as "The Refuge." Squirrels play without fear in this field. Where the trees have been thinned out in the woodland, bluegrass has come up luxuriantly, so that the greater part of fields A, J, and K furnish fine pasture in the early spring.

STOCK.

In the inventory of January 1, 1905, 182 head of live stock were recorded, and on January 1, 1909, there were 200. Averaged for the past five years the proportion of different kinds of live stock is about as follows: Horses, ten; cows and stock cattle, forty; young cattle, ten; hogs, thirty-five; and sheep, about 100. On the average about 160 acres remain in pasture. To show that this farm has about the right area in pasture, the following estimate of pasture area for each class of stock is given:

40 cows and stock cattle.....	80 acres.
10 young cattle	15 acres.
35 hogs	10 acres.
100 sheep	40 acres.
10 horses and colts	15 acres.
	<hr/>
	160 acres.

The dairy department of the farm maintains on the average eight to ten cows. Butter is made and sold in the local markets. It is found to be more profitable to buy young steers and keep them a year than to buy and feed the same year.

Sheep have always been kept on the farm and the profit in them is very satisfactory.

Ten horses and two or three colts are kept on the place. Seven horses are used for farm work and three for driving.

TILLAGE.

Three-horse plows are run from nine to ten inches deep for both corn and wheat. No guessing is allowed on this point, since the furrows are measured frequently to see that the required depth is maintained.

The ground for wheat is prepared in the following manner: As soon after harvest as possible the stubble ground is plowed. It is harrowed, then rolled and harrowed again, the second time with a spike-tooth harrow. A spring-tooth harrow precedes the drill. The wheat is sowed about September 25. Wheat to follow corn is put in as soon as possible after the corn is cut, the land being prepared by running a disk harrow over the field and then a spring-tooth harrow. Sometimes the spring-tooth harrow alone is deemed sufficient. The land is then drilled the same as the plowed ground.

Corn is planted on land which has been in pasture. Before plowing the ground is covered with stable manure. After plowing it is pulverized with a disk harrow and cross-harrowed before the planter. It is harrowed once after planting and then cultivated with two-horse cultivators, the last time or two very shallow.

FERTILIZERS.

The manure spreader is regarded as one of the most important implements on the farm. By means of it, it has been possible during the past few years to cover about seventy-five acres of the farm each year with stable manure.

It is a common practice in this section to use commercial fertilizers when sowing wheat and grass. The fertilizer is mixed on the farm. It consists of a mixture of one-half of ground raw bone, containing twenty-two per cent of phosphoric acid and two and one-half per cent of nitrogen, and one-half of South Carolina ground rock, containing sixteen per cent of phosphoric acid. It has not been the practice on the farm to plow under green crops, although the benefit of such practice is recognized. A

straw mulch has been put on part of a field at different times and plowed under. The results have been good. One year the plowing under of straw alongside of land well manured gave about the same results as manured land. In the year 1909 on field D, a part of the wheat stubble was mowed soon after harvest to serve as a mulch. On the ground that was mowed the clover was taller and more vigorous on September 2. The difference was to be seen also on September 23. The year 1909 being very dry, this covering no doubt prevented the evaporation of moisture and thus aided the clover in making a better growth.

FINANCIAL RECORD OF THE FARM.

Inventories.

A simple but quite complete record of results on this farm has been kept from the time the farm was purchased until the present time. This is in the form of a diary and a bookkeeping record. On January 1 of each year an inventory was made. Tables I, II, and III show inventories for the years 1892, 1905, and 1909, which give a good idea of the development of the farm and particularly of the increase in its value. Under the heading "Plant" are given the real estate and the live stock and machinery which are used in operating the farm. Under the heading "Materials and supplies" are given feed and salable grain and animal products; also live stock which may be sold or used to replace older stock for breeding and dairy purposes.

In 1892 the value of the plant was \$18,167; in 1905 it was \$32,365; in 1909 it amounted to \$41,972. It will be seen that the value of the plant has more than doubled during the seventeen-year period. The net income has more than doubled also so that the increased valuation of the real estate could properly be based on the income.

TABLE I.—*Inventory of the farm, January 1, 1892.*

Item.	Value.	Total.
ASSETS. ¹		
Plant:		
Land, including improvements, etc., 300 acres, at \$55 an acre		\$16,500
House furniture, etc.....		1,000
Live stock—		
2 horses, at \$100.....	\$200	
8 cows and heifers, at \$25.....	200	
8 hogs, at \$4.....	32	
		432
Machinery and tools—		
Farm wagon	50	
Buggy	50	
Harness, etc.	30	
Drill and plows	85	
Harrow	18	
Forks	2	
		235
Materials and supplies:		
Feed and salable products on hand—		
Hay for stock, 30 tons, at \$5.....	150	
Grain for stock, 70 barrels corn, at \$2.....	140	
		290
Live stock—		
2 colts, at \$60.....	120	
27 head stock cattle, at \$30.....	810	
		930
Growing wheat, 80 acres.....		320
		19,707
LIABILITIES.		
Debt on 300-acre farm.....	8,459	
Debt for fertilizer and drill.....	220	
		8,679
Present worth of farm and equipment.....		11,028

¹ The classification of items in these inventories is intended to show approximately the amount of capital invested in land and equipment and the value of farm products on hand. The part of material and supplies needed for the plant equipment is necessarily indefinite. It is therefore regarded as more desirable to include the value of such items under "Materials and supplies."

TABLE II.—*Inventory of the farm, January 1, 1905.*

Item.	Value.	Total.
ASSETS.		
Plant:		
Land, including buildings, etc., 380 acres at \$75 an acre		\$28,500
House furniture, etc.....		1,500
Live stock—		
7 horses	\$550	
7 cows	280	
1 bull	60	
4 brood sows	40	
37 sheep	435	

Machinery and tools—		
Farm machinery and implements.....	400	
Hand tools	100	
Carriages and wagons.....	400	
Harness	100	
		<hr/>
		1,000
Materials and supplies:		
Feed and salable products on hand—		
30 tons of hay.....	240	
250 barrels of corn.....	562	
Bacon, flour, and potatoes.....	150	
Fodder and straw.....	100	
Oats and flaxseed meal.....	60	
		<hr/>
		1,112
Live stock—		
4 heifers	100	
7 yearlings	140	
3 calves	30	
37 head feeding cattle.....	1,245	
23 shoats	75	
2 colts	100	
		<hr/>
		1,690
Growing wheat, 92 acres.....		555
		<hr/>
		35,722

LIABILITIES.

Due on farm.....	8,500
Present worth of farm and equipment.....	27,222
	<hr/>

TABLE III.—*Inventory of the farm, January 1, 1909.*

Item.	Value.	Total.
ASSETS.		
Plant:		
Land, including buildings, etc., 380 acres, at \$95 an acre		\$36,100
House furniture, etc.....		1,500
Live stock—		
6 work horses, 3 driving horses.....	\$1,350	
17 cows, at \$50.....	850	
1 bull	50	
3 brood sows	60	
1 boar	12	
100 sheep	700	
		<hr/>
		3,022
Machinery and tools—		
Farm machinery and implements.....	600	
Hand tools	150	
Wagon and carriages.....	400	
Harness	200	
		<hr/>
		1,350
Materials and supplies:		
Feed and salable products on hand—		
100 barrels of corn.....	300	
60 tons of hay.....	560	
Bacon, flour, and foodstuffs on hand.....	150	
Oats	20	
Fodder and straw.....	100	
		<hr/>
		1,130

Live stock—		
2 colts	120	
18 fat cattle	1,260	
15 heifers and calves.....	375	
34 hogs	170	
		1,925
Growing wheat, 98 acres.....		585
Total resources		45,612

LIABILITIES.

Due on farm.....	6,503
Present worth of farm and equipment.....	39,109

RECEIPTS AND EXPENDITURES.

The items in Table IV are taken from the books kept on the farm. This record includes five years—from 1904 to 1909. Some of the items in this table are estimates; for instance, grain and hay fed to stock. The amount of such materials produced on the farm is known quite accurately, however. The amount sold plus the amount on hand subtracted from the amount produced gives the amount of such products fed. The records are, of course, far from complete, yet the net income is shown with a fair degree of accuracy.

TABLE IV.—*Receipts and expenditures on the farm, 1904 to 1909, inclusive.*

RECEIPTS.						
Item.	1904.	1905.	1906.	1907.	1908.	1909.
Cattle, including fat cattle sold.	\$1,381.87	\$2,684.39	\$200.00	\$500.00	\$1,937.00	\$700.00
Sheep, lambs, and wool	400.00	400.00	500.00	550.00	550.00	750.00
Wheat	1,480.30	1,230.00	751.00	1,557.00	1,157.00	1,682.00
Corn	765.00	969.50	600.00	1,000.00	750.00	900.00
Oats	112.00	.....	.....	.....	60.00	75.00
Hay	490.00	.....	700.00	800.00	900.00	960.00
Pork products ...	72.00	.....	.....	.....	.....	.....
Live hogs	50.00	135.00	300.00	200.00	475.00	750.00
Poultry, dairy, and garden products	350.00	375.00	400.00	400.00	600.00	600.00
Wood	180.00	.....	.....	.....	.....	.....
Apples .....	.....	500.00	.....	1,427.00	512.00	1,680.00
Total receipts	\$5,281.17	\$6,293.89	\$3,451.00	\$6,434.00	\$6,941.00	\$8,097.00

EXPENDITURES.

Item.	1904.	1905.	1906.	1907.	1908.	1909.
Labor ¹	\$500.00	\$400.00	\$450.00	\$500.00	\$700.00	\$700.00
Taxes	170.00	150.00	138.00	145.00	140.00	168.00
Farm supplies ...	250.00	300.00	300.00	300.00	200.00	400.00
Interest on debt.	360.00	360.00	360.00	344.00	260.00	240.00
Fertilizer	150.00	135.00	116.50	147.86	185.39	185.39
Seed	211.00	212.00	150.00	150.00	197.50	188.00
Grain and hay for stock (produced on farm and fed)	500.00	550.00	400.00	600.00	750.00	600.00
Cattle bought for feeding	650.00	1,763.00	.....	.....	781.24	.....
Hogs for feeding.	.....	36.00	.....	.....	.....	.....
Extra labor pick- ing apples, etc..	.....	.....	.....	300.00	.....	418.00
Total expendi- ture	\$2,791.00	\$3,906.00	\$1,914.50	\$2,486.86	\$3,214.13	\$2,899.39
Net Income ²	\$2,490.17	\$2,387.89	\$1,536.50	\$3,947.14	\$3,726.87	\$5,197.61

¹ The labor of the family is not counted as an item of expense.

² Net income, as understood on this farm, includes interest on investment, profits, and reward for the labor of the family.

CORN AND WHEAT.

Tables V and VI relate to corn and wheat production. The average yield of wheat during these years was eighteen bushels an acre; that of corn nearly forty bushels (eight barrels) an acre. These were fair yields, somewhat above the average for this region. The average cost per acre of raising wheat, as given in this table, is \$6 an acre. In this estimate the rent of land and the cost of superintendence are not included. It is believed that these figures fairly represent the cost of raising wheat in this region.

The tables show no record of the cost of raising corn. The owner estimates, however, that it costs more to raise corn than wheat.

Hay on this farm is handled by modern machinery. It has produced on the average about one and one-quarter tons per acre.

TABLE V.—Yield and cost of wheat crop, 1892 to 1908, inclusive.

Year.	Area. Acres.	Yield per acre. Bushels.	Cost of fertilizer per acre.	Total cost per acre. ¹	Total cost per bushel.	Selling price per bushel.	Profit per acre.
1892.....	63	21	\$2.70	\$7.56	\$0.36	\$0.60	\$5.04
1893.....	73	26¾	2.12	5.78	.22	.47	6.64
1894.....	55	19	1.20	4.69	.24	.66	7.85
1895.....	68	18	.90	4.65	.25	.60	6.15
1896.....	55	25	1.12	4.30	.17	.75	14.10
1897.....	64	22	1.35	5.95	.27	1.00	16.05
1898.....	70½	15	1.64	6.32	.42	.66	3.58
1899.....	112	23 1-3	1.41	6.41	.27	.70	9.92
1900.....	82	17	1.25	6.04	.35	.68	5.52
1901.....	90	12½	1.70	6.71	.53	.70	2.05
1902.....	100	10	1.17	6.30	.63	.78	1.50
1903.....	100	15	.98	4.80	.32	.85	7.95
1904.....	91	17	1.17	6.84	.40	.80	6.76
1905.....	87½	20	1.55	6.96	.34	.86	10.34
1906.....	77½	13	2.38	7.40	.57	.74	2.21
1907.....	78	16	1.35	6.92	.43	.89	7.32
1908.....	95	16	2.00	5.47	.34	1.15	12.93

¹ The cost of labor, seed, and fertilizer is included in the estimated cost for each year, the labor being estimated on the basis of what it would cost to hire the work done at the market price.

TABLE VI.—Yield of corn and price per barrel of crop, 1892 to 1908, inclusive.

Year.	Area. Acres.	Total yield. per acre Barrels.	Yield per acre Barrels.	Price per barrel.
1892.....	44	440	10.0	\$2.00
1893.....	55	169	3.1	2.00
1894.....	45	291	6.5	1.25
1895.....	50	293	5.9	1.50
1896.....	55	445	8.1	1.00
1897.....	40	306	7.6	1.25
1898.....	40	251	6.3	1.25
1899.....	30	187	6.2	1.50
1900.....	60	438	7.3	1.75
1901.....	55	545	9.9	2.25
1902.....	58	488	8.4	2.00
1903.....	60	450	7.5	2.00
1904.....	38	340	9.0	2.25
1905.....	42	491	11.7	2.00
1906.....	40	320	8.0	2.00
1907.....	44	397	9.0	2.50
1908.....	44	300	6.8	2.50

WHAT THE FARM HAS BEEN MADE TO ACCOMPLISH FOR THE FAMILY.

An attempt has been made thus far in the record given to set forth the actual operations of the farm. They are not set forth as models. On the whole, however, they represent good farm practice.

To just what degree this family has been successful depends upon the point of view taken. The financial record might seem to some disappointing, considering the amount invested and the number of people taking part in the labor producing these results. In terms of dollars and cents it might not be considered a paying business. On the other hand, if we consider the results produced through the use made of the net income, the farm tells a different and a more satisfactory story. As was stated in the introduction, the intention in going on the farm was not primarily to increase the income, nor were money profits more than a secondary consideration. In the first place, the father was ill and was told by his physician that he could not live another year in the city if he continued his business. Some of the children were very young, while others were ready to enter the university. In order to measure success from the standpoint of the father and the mother we must know about the family and what it has accomplished and is doing.

The boys have graduated from a state university and the girls have been educated by private tutors and in girls' schools. At the present time two sons are lawyers, one a minister, one a professor, one a civil engineer, and one a farmer. The education of the children has cost the farm about \$10,000. During the time the children were being educated there was no income except from the farm. At the present time these sons and daughters are profitably employed in honorable and useful occupations. While but three remain on the farm, one son and two daughters, all are following their present callings with the end in view of buying farms on which to make their homes.

Each year all members of the family, including grandchildren, spend their vacations on the farm. This is usually in harvest and haying time, so that no extra labor is hired during these farm operations.

The father declares that he has improved in health every year since coming on the farm. Now seventy-six years of age, he superintends all farm operations and knows the details of every-

thing that is going on. He still enjoys good health and is fairly strong, being able to walk to every part of the farm. It must be remembered that he came on the farm long after most farmers begin to think of retiring, being then sixty years of age.

The farm work is not regarded as drudgery, and there is an atmosphere of refinement about the home that indicates a wholesome life on the part of the family. Everyone on the farm is occupied with some kind of work, and the farm operations go on in a businesslike manner, but no one is rushed or overworked. The mother is well preserved and vigorous, with no trace of overwork, though she has always been active in the management of the home and farm. She believes that the farm life, on the whole, has been easier for her and more enjoyable than the life in the city. Every member of the family is in love with farm life and expects to live on a farm when conditions permit.

SOCIAL AND AGRICULTURAL PROBLEMS SATISFACTORILY SOLVED.

(1) A professional man, with no previous experience as a farmer, with a large and expensive family, is able to rear and educate his children on the income of a well-located farm of 380 acres of good land with a modernized dwelling upon it. On a salary of \$3,000 in the city the same amount of money could not have been expended on their education and a fair standard of living maintained. This fact is indicated in the inventory of 1892, which showed the present worth of the family to be \$11,028, about \$5,000 of which represented the savings of twenty-two years, the remainder being inherited. The present worth of the family, as represented by the farm in 1909, is \$37,662. About \$15,000 of this increase in present worth is due to increase in land values. This leaves nearly \$12,000 to represent savings during the period when the children were receiving their education.

Business training and experience have been important factors in the success achieved. The father, who, at the age of seventy-six, still keeps in touch with all the farming operations, says:

"My life as a soldier taught me how to obey and command, how to economize and endure. My life in the city as a lawyer in charge of a title and trust company taught me system and business methods, all of which were valuable to me on the farm."

A fact of special importance in this record is that these results were accomplished by following the established methods of farming. The yields are a little above the average for the community, because of more thorough tillage methods, but no extraordinary yields are recorded. The diary kept by the farmer and the history as written show keenness and foresight in adjusting crop and stock products to market conditions. The management of farm operations, although adjusted to the comfort and tastes of the family, have been conducted strictly on economic principles. From this standpoint a problem of great interest and importance has been worked out on this farm.

(2) The members of the family believe they have had more opportunities in the way of general culture gained by travel, etc., than would have been possible for them in the city. Socially they think there has been no essential loss; in fact, it is quite probable that the farm life has given better opportunities for culture of the most wholesome kind than the city would have afforded.

(3) The labor problem has been satisfactorily solved on this farm. With such wages as the farm could pay, the laborers have been able to accumulate sufficient property in a few years to take up farming for themselves. At the same time the women of the family have been relieved of extra work and responsibility necessarily attending the boarding and lodging of laborers; also the family life has been more homelike. The service secured in this way has been good, and on the whole the relations between employer and employed have been remarkably satisfactory.

(4) It has been found practicable and beneficial to train the children through occupations which require them to assume responsibility. As an inducement to make the chosen line interesting and as an incentive to industry, the profits of the industries

on the farm went to the children managing these departments. It is the testimony of all who know the family that the children are all efficient managers.

(5) It has been demonstrated on this farm that an acre of garden, without any particular specialization in crop methods, can be made to pay the expenses of the table for a large family.

(6) The value of agricultural literature to the farmer is clearly demonstrated on this farm. Asked what benefit such literature had been to him, the father replied: "I would have been blind without it." The knowledge of spraying for San Jose scale saved a valuable orchard which is today the most profitable part of the farm. Fifteen or twenty well-chosen works on farming, with selected bulletins from State experiment stations and from the United States Department of Agriculture, constitute an important part of the farm library. Several standard agricultural papers are also taken.

A SERIOUS PROBLEM.

Since 1905 there has been a marked increase in the income of this farm, due principally to the apple crop. About the same time a sharp advance took place in the price of field crops and of live stock, and these prices have advanced since. As a result of these conditions the net income for 1909 was \$5,197.50, the largest in the history of the farm. That the advance in income is not due, however, to increased productivity of the soil is disclosed by the records of the farm. An examination of Tables V and VI shows that wheat has decreased in yield per acre to a marked extent during the last half of the seventeen years. The average yield of this crop during the first half of this period was twenty-one bushels, and during the last half fifteen bushels per acre. Corn, however, made an average of thirty-five bushels per acre during the first period of eight years and 43.5 bushels during the last nine years. On the other hand, clover and timothy have about held their own in yield during the entire period, the average being about one and one-quarter tons per acre. The increase

in the yield of corn may be accounted for largely by an important change in the method of tillage. The proprietor of the farm now gives corn shallow cultivation during the last two times, whereas formerly he followed the usual custom of cultivating deep at all times and "hilling up" the corn at the last cultivation. This method of cultivation, together with an increase in the depth of plowing, which is now nine to ten inches, has greatly increased the yield of corn. It is to be noted also that a small quantity of lime, 300 to 400 pounds per acre, was put on the land at intervals with beneficial results to clover and thus indirectly to corn.

A statement in a letter lately received from this farmer shows that the soil has been held up to a normal standard of productivity with great difficulty and is in danger of decline. He says: "We are not getting the results for our labor and land that we should. I think we must work out a rotation that will give us larger yields of wheat. This I think can be accomplished by getting rid of the sorrel in our land and growing more clover and other leguminous crops. The wheat crop is the measure of all other values as a rule, and if we can grow more and cheaper wheat it will do more to reduce the cost of living than almost anything else."

This farm has a very good financial record, due to intelligence and the application of business methods in management. But one of the essential factors in the management of a farm is maintaining or strengthening those soil conditions which are favorable to the production of such value-producing crops as it seems desirable to raise.

If such conditions are not maintained certain weed pests, which find the soil favorable, come in and take the place of cultivated crops. The farmer is often misled by this fact and regards the presence of weeds as the direct agent preventing the vigorous growth of crops, where the real cause may be the lack of a proper environment for the crops. For this reason at-

tempts are often made to subdue weeds by cultivation alone, which is only partially successful and adds unnecessary expense.

The fact that sorrel is a persistent and troublesome weed on this farm is evidence that fundamental conditions of soil are defective and that other methods besides cultivation must be planned to subdue it and allow the desirable crops to take its place.

It is suggested, therefore, that a rotation of crops and some system of cultivating the soil be adopted which will build up and maintain the land in a condition which will better enable the cultivated crops to combat the weed enemy in the struggle to possess the soil.

The practice of liming the soil is found to be beneficial in this region, stimulating the growth of clover and thus tending to eliminate the sorrel. On this farm lime could be applied at little expense, since in many places limestone rock crops out at the surface. This rock could be blasted out and either ground or burned to be scattered on the land. This could be done at shorter intervals than formerly or a heavier application made of 1,000 or 2,000 pounds to the acre.

Besides the use of lime and commercial fertilizer the following rotation are suggested, the practice of which would speedily supply humus and nitrogen, materials which are essential in maintaining the soil in a condition favorable to field crops:

Corn plus crimson clover or rye and hairy vetch.

Cowpeas.

Wheat.

Hay (6 pounds of clover seed the following spring).

Pasture.

Crimson clover has not generally proved successful here and should be tested on a small area before sowing a large quantity. Three conditions at least are essential for a satisfactory growth of crimson clover. The soil must be inoculated with the proper bacteria, it must contain a fair amount of humus and nitrogen, and the seed must be sown sufficiently early in order to make a vigorous growth before winter.

Rye and hairy vetch are adapted to more general conditions, may be sown later than crimson clover, and will grow under conditions that will not produce crimson clover. It is essential that the land be artificially inoculated for hairy vetch unless the bacteria are known to be in the soil. The six pounds of clover seed to be sown the spring following the hay crop are essential in getting a stand of clover to plow under the next year for corn.

Alfalfa may be grown successfully on clean and fertile land in this region. When these conditions can be met the following rotation is advised:

Corn plus crimson clover or rye and hairy vetch.
Cowpeas.
Wheat.
Alfalfa.
Alfalfa.
Alfalfa.

On land that is fairly rich in nitrogen and humus, if the problem were simply to maintain fertility, a shorter rotation could be adopted by cutting out one year of wheat on this farm, making it a four-year rotation, which would have the effect of growing more legumes. It has been demonstrated that such a rotation as this would gradually increase the nitrogen and humus content of the soil. Minnesota Agricultural Experiment Station Bulletin No. 109 gives the results of experiments carried on in several places through a series of ten years with a rotation of corn, wheat, hay, and pasture, and it was found that the humus and nitrogen could not only be maintained but increased.

One or the other of the two rotations first suggested will no doubt be adopted on this farm, at least until the land is built up to a normal standard.

FARM IMPLEMENTS AND THEIR COST.

The following is a complete list of the machinery and implements used on the farm described and their cost:

List of farm implements and their cost.

1 seven-foot-cut wheat binder.....	\$135
1 six-foot-cut wheat binder—old—for use in case the other gets out of repair.....	100
1 five-foot mower.....	35
1 four-foot mower.....	30
1 manure spreader.....	80
1 ten-spout wheat hoe drill.....	75
1 eight-spout wheat disk drill.....	60
2 disk harrows (one tongueless).....	50
2 spring-tooth harrows.....	27
2 spike-tooth harrows.....	24
2 two-horse chilled plows.....	12
2 three-horse chilled plows.....	18
2 walking wheeled double cultivators.....	50
4 double-shovel plows.....	10
1 double smoothing harrow.....	12
1 two-row disk corn planter.....	40
1 single-row corn planter.....	12
1 iron roller.....	12
1 plank drag.....	2
1 hay loader.....	60
1 side-delivery horserake.....	40
2 single-horse cultivators.....	14
2 four-horse wagons.....	120
1 two-horse wagon.....	50
2 road beds for wagons.....	40
2 hayracks	20
1 steel spring-tooth hayrake (10 feet).....	20
1 spring-tooth weeder.....	9

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CHAPTER VI.

SOIL AND AGRICULTURAL PROVINCES OF THE UNITED STATES.

It is our object in this chapter to outline in a general way the most important soil and agricultural provinces in each one of the States of the Union, and to describe briefly present conditions of agricultural development. The various divisions frequently merge from one into another with such a gradual change that the lines are necessarily more or less arbitrary.

The maps presented in this chapter are based most largely upon the work of the Bureau of Soils, though the Weather Bureau, the U. S. Geological Survey, various State Geological Surveys and the work of some of the Experiment Stations has been drawn upon for material from which to construct some of the maps.

Wherever soil types, soil series, soil provinces or groups are mentioned in this chapter the terms refer to the soil classification followed by the Bureau of Soils. Bulletins No. 55, 78 and 85 of the Bureau of Soils deal with this subject in considerable detail and should be consulted if more information concerning this classification is desired.

In some instances the maps are based in part upon climatic conditions. In California, for example, it appears that the variations in the climate in various portions of the state are of more importance than the variations in the soils, therefore, this map shows climatic zones instead of soil provinces.



MAP 1.—*Soil and Agricultural Map of New England States.*

NEW ENGLAND STATES.

Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island.

1. Mostly timbered regions, with but little agricultural development. Rough and mountainous in part. Some grazing. Some of the land, especially in Maine, will be suitable for farming when cleared.

2. The great potato growing section of Maine. Soils mostly sandy. This region is being extended as rapidly as the forests are removed.

3. Chiefly grazing with some tillage land. Surface rolling to broken in most places.

4. Sections including what is probably the best farming land in New England. Dairying, grazing, hay, vegetables and fruit. Stones and rock outcrop plentiful in some localities.

5. Including areas producing large amounts of maple sugar and maple syrup.

6. Region of intensive farming in which fruit, tobacco and gardening are leading interests. Some general farming and dairying also.

7. Regions in which the growing of onions is the leading industry. Other special crops grown and market gardening also carried on.

8. Regions in which the poultry industry has been highly developed. Some general farming, dairying and gardening also carried on to a lesser extent.

9. Localities in which the cranberry is extensively grown. Soil mostly sandy bogs.

NEW ENGLAND.*

Opportunity awaits the man who engages in agriculture in New England. This is true of the farmer already here, who should henceforth widen his horizon and enlarge his occupation of the field. It is also true of the man west or south of New England with inquiring eyes turned in this direction. The first named, thus far, with some notable exceptions, has not wholly lived up to his opportunities. The second, very probably asks to be "shown."

New England agriculture for various reasons is worth while in every sense of the term; it still has an abundance of relatively cheap land, making it possible to successfully undertake farming without heavy outlay of capital; it has nearness to the best cash markets of the world; its farm products bring high prices; it shows a practically unlimited outlet right at home for more than New England can produce; rates of freight to market are especially low compared with the long hauls further west, though not yet as low as they should be, in some instances.

As a side-light on this general summary, here is an incident which actually took place, in the autumn of 1910, on the occasion of a field meeting of the Connecticut fruit growers. Extensive orchards in profitable bearing were in the foreground, fruit being harvested; quick, nearby markets assured short hauls and high prices. Among the visitors was a representative of the famous Hood River, Oregon, fruit section. He acknowledged the impressiveness of the attractive money-making proposition spread out before him on the Connecticut hillside. Turning to J. H. Hale, the peach king of Connecticut and Georgia, the Oregon man asked where could be found similar splendid opportunities to buy orchard sites. "There, directly across the road," came the quick positive response of Mr. Hale, "and over yonder

* The data and descriptive matter covering the New England states has been taken from the book "New England" and is reproduced here by permission of the Boston Chamber of Commerce—publishers of this valuable work.

is another just as good. And more and more of these splendid orchard sites all the way up through Connecticut and western Massachusetts; and in fact, through most of the distance still further north to the Canadian line."

For so many decades of years has agriculture been prominent in New England that it may seem unnecessary to give much attention here to its topography, its physical characteristics, its rainfall and its climate. Yet it is not amiss to remind the reader that in these things New England has much which is really advantageous for the pursuit of farming.

As latitude goes, New England is fairly well to the north. Yet, a glance at the map will show it, in this respect, fully as favorably located as many other portions of the country which are given over to crop production. In fact, the matter of a northerly latitude as long since proved its real worth in the turning out of fruits, vegetables, cereals, and grass crops of the highest order.

Within a comparatively short time, scientists, making special study of cereal culture, have presented strong arguments to show that such small grains as wheat, rye, and oats make a heavier rates of yield to the acre in northerly latitudes than further south. The heavy rate of yield of wheat in England is somewhere around thirty-three bushels to the acre, and nearly as much in northern France and in the Netherlands, against our own average in the United States of only fourteen to sixteen bushels. For that matter, it is not necessary to cross the Atlantic Ocean to find positive evidence of what may be accomplished in northern latitudes. In western Canada, 400 miles north of the international boundary line, magnificent crops of wheat and oats are now grown. The Canadian crop of 1910 was something like 100,000,000 bushels. Going still further north in the western hemisphere wheat is produced each season in the Peace River valley at a latitude of 58°, where as the northernmost point of Maine is only 48°.

Keeping away from technicalities in a plain statement of agricultural conditions in New England, it will suffice to remind the reader that in this moderately high latitude, as well as those still further north, the sun gets in its work very early in the day, during practically all of the growing season, and continues until a late hour in the afternoon. Thus a field of grain, or cultivated crop, or small fruit, receives during the growing season in each day of clear sky a maximum of sunshine, forcing nature in its work of development, maturity, and full fruition.

The condition and prospects of agriculture in New England are thus conservatively summarized by President Kenyon L. Butterfield of the Massachusetts Agricultural College:

“I came to New England eight years ago. I soon found very optimistic belief in regard to the future of agriculture in New England, and that belief has strengthened with the years.

“Of course, there are difficulties, drawbacks, problems. For one thing, we have to admit the spotted character of the land. There is no great area of uniformly rich soil. The soil on a given farm is often of many different types. A single town may have good and poor land. This fact makes it difficult to localize a given crop and bring to the community a great reputation for a specialty.

“All over the north at least farm labor is scarce, but perhaps New England farmers suffer more than any others because of the presence of a large number of mill villages which tempt farm boys and girls from the surrounding regions to steady positions, even at small wages, in exchange for what have seemed to be the uncertainties of the farm.

“Farmers everywhere have failed to cooperate, but perhaps the failure is more marked in New England than anywhere else. The New England farmer likes to paddle his own canoe. Of course individual farmers of superior intelligence make more profit in this way than they perhaps would by cooperating, but agriculture as a whole is put to a great disadvantage. The individual method of marketing, for instance, is a very costly one.

This might not matter so much to the farmer if the consumer paid all the costs of marketing; unfortunately he does not. A clumsy system of marketing robs the farmer of some of his profits.

“Although New England has a small area, and is interlaced with a network of steam and trolley roads, nevertheless the facilities for cheap transportation of farm products to the nearby markets are not as good as one might expect. It costs more for the average New England farmer to get his goods to the market than it ought to cost and this fact makes the competition with the western and southern growers more serious than would otherwise be the case.

“But these difficulties simply mean problems to be solved. They are not insuperable difficulties. On the other hand, there are positive and real advantages possessed by the New England farmers. The first is the *market*. It is a big market. It consists not only of the great city of Boston but of many minor cities and villages, altogether making a large consuming population within restricted area. The market is near the average farmer. It is a growing market. Nearly all of the New England cities have shown a tendency toward growth during the last ten years. It is a high grade market, calling for products of quality. It is a sympathetic market; that is to say, if the proper steps are taken the New England consumers will express a preference for New England grown products.

“It is sometimes asserted that the soil of New England is a drawback. On the contrary, it is an asset. True, there are many square miles in New England consisting of ledges, others almost plastered with boulders; but wherever there is clear soil, it is good soil—the very best. There are areas that are worn, because they have been over cropped and mismanaged, but all the New England soils respond bounteously to proper treatment.

“There are some special advantages. The rainfall in New England is abundant, and well distributed, as a rule, throughout the growing season. This is shown in the marvelous tree growths.

Forestry therefore can be made a permanent agricultural sub-industry. Fruit trees grow vigorously also.

“And then there is the fruit *flavor*. It may be soil, it may be climate, it may be the altitude of some of the hills; but no matter what it is, there are few spots on the earth where apples particularly take on a better flavor than in New England. This is an asset of tremendous importance.

“The grass-growing areas in New England are unsurpassed for native power in producing good hay. Even the hillside pastures are of superior quality. The Lord intended that in New England there should be cattle on a thousand hills, and it is only man’s fault that there are not. We might add sheep, too, to the category, if it were not for the curse of curs.

“The fact of greatest promise is that we are undergoing a great awakening in New England agriculture. Farmers have a new look of hope. Business men are particularly interested. Leaders in community life are interesting themselves in the country problem. All New England is stirring as perhaps never before in all its history, with things agricultural.”

This brief summary by President Butterfield expresses the most conservative views. A permanent and gratifying success should, in the years to come even more than ever before, attend farming in New England. This is true of the men and women living here and engaged in some line of agriculture. It is also true of those outside the confines of the six states, who may be impelled through the authenticated records to cast their lot in New England. Farmers now engaged in this pursuit will remain here. Not in many years have they been so well satisfied with agriculture in New England as today—in the ledger accounts, the cash box, the home life, and social opportunities.

Farmers not now in New England, but who are considering the advisability of coming here, will have read this chapter in vain if they do not adequately grasp the facts portrayed. In the briefest sort of way, attention is called to these advantages: Relative cheapness of good farming land; productivity of soil

and ease of working it when properly handled; profits in various staple crops and New England specialties; good roads, nearness to the best and highest cash markets in the world; a network of rural free delivery routes, and passenger, freight and express trolley lines, and telephones; the best schools, colleges and libraries in the world; freedom from the isolation of the less settled communities; social life of a high character and atmosphere; environment conducive to the best things in the home life. As to financial returns, no section of the country can show better results, considering the risk. New England lands have a moderate to low average value. They will produce the best and biggest crops, and the markets are right at the farmer's door. However poor in purse a man may be, if he has grit, ambition, and real purpose, he cannot fail to succeed in New England.

Farm lands command a wide range of prices. It is safe to say that in some of the hill towns, where there are great stretches of rough land, with here and there, a bit of tillable soil, purchases may be made at the remarkably low price of \$10 per acre, or less. But in such instances the land is not well suited to cultivated crops, or even to meadows, and may be remote from a railroad. Such areas have attraction in the way of grazing sheep and goats, or fattening cattle. In the plains or uplands are great stretches of gravel loam land that are well suited, under proper handling, to many crops. Such land can be bought at medium prices. The rich valleys and river bottoms found in many parts of New England are especially well adapted to growing onions, potatoes, celery, asparagus, and other truck crops; also strawberries, roses, vegetables, etc. Such land found in the Connecticut valley, from the lower confines of Vermont and New Hampshire down through Massachusetts and Connecticut nearly to Long Island Sound, is held at high figures where particularly well located, with soil deep and rich, and well calculated to produce to perfection some of these special crops. This is true also of some of the market garden sections, five to twenty miles out of Boston, Worcester, Springfield, Hartford,

Manchester, Portland, etc. Such soils, while heavy and often very black, are not sticky, even after smart rainfall, and are readily worked. The price for land of this character runs high; all the way upwards from \$400 to \$500 per acre. Good potato land in northern Maine is worth around \$100 per acre, and not infrequently rents by the season at \$10 and upwards per acre. Near the large cities desirable land for trucking sells as high as \$1,000 an acre and gardeners are able to pay that price and coin big money. Two or three crops are raised on the same land each year. These specialities include the general line of vegetables, such as spinach, lettuce, radishes, cabbage, cauliflower, sweet corn, tomatoes, celery, etc.

Agricultural education is receiving attention in several ways in New England. There are the agricultural colleges and the experiment stations, the boards of agriculture, the grange, dairying, and horticultural societies, bee keepers' and sheep breeders' associations, the press, and latterly, commercial organizations and corporations such as boards of trade and railroads. Each of the new England states has a state agricultural college and experiment station; Connecticut has two of the latter. Maine's college and experiment station is in connection with the state university at Orono; Vermont's in connection with the Vermont university at Burlington. The New Hampshire college and experiment station are at Durham; Massachusetts at Amherst; Rhode Island at Kingston. Various eastern institutions in later years have awakened to the fact that it is not sufficient to teach the boys and girls at the institution, and to dig out certain facts connected with agriculture. Important as these are, the institution must go further and do something for the farmers who have not the time, nor perhaps the money, to 'take college courses. They have learned that it is one thing to experiment and quite another to get the results in actual operation on the farms. Therefore the colleges and experiment stations are featuring what they term "extension work." The facts learned at the college are taken direct to the farmers and applied to the every day problems of the farm.

Demonstrations and object lessons are given of approved methods of caring for orchards, livestock, crops, etc. Men in close touch with both the college and the rural end of the proposition devote their entire time to getting the farmer and the institution in this closer relation. The purpose is to disseminate some of the useful information which in the past has been allowed to lie in pigeon holes until it finally reached the backyard fire dump. In close sympathy with this same spirit of practical results are found the grange, the boards of agriculture, and other organizations, aiming to dignify and uplift agriculture.

Maine.

Maine is well watered with innumerable lakes and ponds, while the rivers and small streams do much to conserve the interests of the valleys and fertile fields. The northern counties in the state have a comparatively short season for crop growing, yet the energy of the sun, combined with generous rainfall, makes that territory, particularly Aroostook county, famous for its crops. Alluvial plains of remarkable fertility are found throughout much of the state, which show evidences of having been at one time bottoms of old lakes long since dried up or drained out. While much of Maine is rugged and broken by high hills and ranges of mountains, there still remain large areas of cultivated land, some of which in recent years has been brought up to a high state of fertility. In this respect Maine is identified with "extensive agriculture" more peculiarly than other eastern states. To the man with a wide horizon who has made a study of agriculture east and west, farming in Maine is easily comparable, even though on somewhat smaller scale, to conditions in the Middle West. The Aroostook region in the northeastern part of the state comprises probably the largest area given over to fertile farming land in New England. The State, agriculturally speaking, devotes much attention to such crops as grass, potatoes, apples, all of these being very successfully produced on a large scale. Cereal culture has not been accorded

very much attention, although within the past ten years some notable successes have been made in wheat, oats, rye, with a tendency for still further attainment. In such specialties as potatoes and apples the very best agriculture is followed. Hay and forage crops are given much attention and the yield is very heavy. Maine is each year becoming more of a dairy state, requiring enormous amounts of feed of this character. While stock raising is carried on in a somewhat limited manner, interest and the best thought of agriculture in northern New England favors going more and more into breeding and feeding meat animals, in dairying, and in the production of horses.

New Hampshire.

While the Granite State can boast of the highest mountains in the eastern part of the United States, it also has many fertile plateaus and delightful valleys. Nor are all of these given over to summer homes. In the growing season precipitation is usually ample for the production of crops. In fact a noteworthy thing about all of New England is its general freedom from serious drought. To the man born and reared in New England, such things as "hot winds," the "firing of corn," and absence of rainfall is practically unknown. The State is well drained by numerous streams of water. In passing, it is not amiss to mention the considerable wealth of forests found in the upper half of the state. As a crop, hay is a leader, with the dairy industry prominent, while increasing attention is being given to apples. If New Hampshire is growing less in the way of cereals than years ago it is because its farmers find it more profitable to use the land in some other way, buying needed feed stuffs and grain. In recent years enlarged attention has been given to the growing of silage corn, which is now considered a requisite in the well established dairy. The potato crop is also an important one in New Hampshire, while small fruits and truck farming are given much attention.

Vermont.

Bounded on the east by the Connecticut valley and the stream which gives this its name, and on the west by Lake Champlain, Vermont is a land of hills, mountains, fields and meadows. A healthful and bracing climate adds to its attractiveness. It has a reasonable amount of heat and cold. In the valleys, especially in the western part of the state, there is much land which is adapted to the production of crops, and agriculture has always constituted the leading industry. Under the influence of intelligent farming the rate of yield to the acre is high. While the '80's and early '90's found many Vermont farmers turning their faces toward the cheap lands in the West, a better feeling has prevailed in recent years, with an appreciable uplift in agricultural conditions. As to crops, hay is the leader, while liberal quantities of oats and potatoes are grown, with an important output each season of barley, buckwheat, and maple sugar. Vermont seems particularly adapted to apples and plums, the fruit showing high color, good flavor and quality.

Massachusetts.

While the river valleys with very heavy soil are usually considered more attractive in point of producing capacity, Massachusetts has many evidences of agricultural prosperity in its higher plateaus and hill towns. West of the Connecticut River, which cuts the state squarely in two from north to south, Massachusetts is much broken, yet agriculture is forceful, even in such elevated areas and narrow confines as some of the valleys hedged in by the Berkshire hills. Eastward from the Connecticut river the topography of the State is more gently marked by low hills and great stretches of plains, sloping gradually to the sea-coast, and elevation entirely disappearing in the famous cranberry bogs and sandy beaches of Barnstable and Plymouth counties. As to climate, it is in the middle of the north temperate zone, temperatures showing a fairly wide range. Yet

the frost period from December to March is not severe upon orchards and other crops, while the growing season is favored by generally sufficient and well distributed rainfall. This, with the genial sunshine and higher temperature of midsummer, force to the greatest perfection the crops for which Massachusetts is famous, such as corn, cigar-leaf tobacco, apples and small fruits, onions, potatoes, etc. Massachusetts has a larger population than any other of the New England states, and the proportion of the people actually engaged in agriculture is relatively small. Such portions as are not adapted to agriculture are receiving attention on the part of the farmers and others who are interested in forestry.

Connecticut.

In the development along agricultural lines in the last decade of years Connecticut might properly be called "the land of the rosy peach;" for this great commercial crop has become one of the fascinating features of Connecticut agriculture, and the State now takes second place to no other as a producer of this fruit. As in other parts of New England, grass is the leading crop. Hay, ever and always, in this part of the country, commands very high prices. The farm value of hay, according to official figures, is higher in Connecticut than in any other state, being placed at \$19.30 per ton. The valley land of the Connecticut is particularly well suited to extensive farming, and some remarkable yields have been made in grasses, in tobacco and in corn. The rougher portions of the State further east afford great possibilities in grazing at a low cost. Owing to the fact of many large manufacturing centers, the home markets for fruit truck, dairy products, poultry, and eggs are large.

Rhode Island.

Small in size but big in accomplishment, Rhode Island is more than a great industrial center, or a political ganglion.

While part of its area is rather rough land, even that is well adapted to pastures and dairying. In the truck sections, close to tidewater, splendid crops of potatoes and other vegetables are produced. There are several notable apple orchards, and many examples of the most advanced farming ideas. In the eastern part of the State the poultry industry has been developed to a high state of perfection.



MAP 2.—*Soil and Agricultural Map of New York, Pennsylvania and New Jersey.*

Map Legend.

1. Glacial Lake Terraces. Once covered by an extension of the Great Lakes, later the deposits were modified to varying degrees by glacial action. Very good general farming country with large amounts of fruit along the shore of Lake Erie and Lake Ontario. Dairying very important industry. Soils variable but adapted to wide range of crop production.

2. Glacial and morainic section. Mountainous in eastern por-

tion. General farming and dairying chief types of agriculture. Numerous valleys in rougher section where good farms are found. Large amount excellent grazing and an abundant supply of pure water.

3. Appalachian Mountain region. Very rough and mountainous, with numerous valleys of varying size, in which agriculture is practiced. Some table lands and plateaus where farming can be successfully carried on. Mountains rich in coal. Oil plentiful in places in this region. Fruit can be raised successfully in many places.

4. Piedmont Plateau. Rolling country having strong productive soils, for the most part. General farming and dairying leading types of agriculture. Some fruit and trucking.

5. Limestone valleys. Soils derived from limestone and naturally very productive. General farming, dairying, tobacco and all crops common to the region are successfully grown. Numerous small valleys not indicated on this map.

6. Coastal Plain region. Very sandy soils with sandy clay subsoil in places. Trucking highly developed in numerous places. Near best markets of the country and well supplied with railroads. Great variety of truck crops, peaches and other fruits. General farming and dairying also practiced.

New York.

Among the opportunities along the line of agricultural development offered by New York, the reclamation of abandoned farms is a subject worthy of special note. There are a large number of these farms scattered throughout various parts of the State and for a considerable period many of these have yielded no income whatever for their owners.

The reason for the abandonment of these tracts of land, briefly stated, is that the methods of farming followed upon them were such as exhausted the productivity of the soil. The same crops were grown upon the same fields year after year and little or nothing was returned to the land to replace the plant

food taken up by the growing crops. In time the yields were reduced to a point where farming under the old system was no longer profitable. The cheap, fertile lands of the west attracted the attention of many of the eastern farmers, who finally left their old homes to begin again in a newly developing section.

During the past decade the advance along the line of scientific agriculture has been very marked and attention has been called to the opportunities offered by these abandoned farms. It has been found that by following certain methods of cultivation, fertilization and rotation of crops these lands can be brought back to a very high state of productivity in the course of a few years. Many such farms can be bought for less than the original cost of the building, and those seeking profitable investment and the establishing of a home in the country, should not overlook these facts.

Dairying is the leading branch of agriculture in the state and New York ranks second in the Union in the production of dairy products. The large cities of the east which are all within easy reach offer excellent markets for all dairy and other farm produce. While the dairy industry is highly developed, there is still opportunity for those wishing to engage therein. It is profitable in itself and it is the surest means of maintaining and increasing the productivity of the soil.

The portion of the State along Lake Ontario is well adapted to fruit raising and large orchards are to be seen all along the lake shore. For those who are willing to follow the most scientific and up-to-date methods in planting, cultivating, spraying, packing and marketing, there are good openings along the line of horticulture. Apples, peaches, pears, grapes and plums are all grown with success and excellent markets are close at hand.

Where such good markets are so close at hand as is the case throughout New York the greatest success in farming will come by specializing in the production of some one thing or several things and in catering to the demands of some particular class.

The raising of poultry can be made a profitable business. For example,—a reputation can be established for the supplying of fresh eggs. A fancy price can be asked and secured when people are absolutely sure of getting fresh eggs.

Near the large cities and along the main railroad lines the trucking industry can still be developed to a greater extent. Many who are now cooped up in poorly ventilated tenement houses and working on a small wage, could readily take up a few acres and by studying the conditions they could make a comfortable living raising truck crops. They would have the advantage of healthful surroundings, plenty of fresh air, a good place to rear the family and all concerned would stand a better chance in the struggle for existence than in the crowded city.

Some special studies have been made of the abandoned farms of New York by the Bureau of Soils, and the results of their findings can be secured by writing that department at Washington, D. C.

Pennsylvania.

A large proportion of Pennsylvania is rough and mountainous and therefore of little value for cultivated crops. The chief agricultural regions are confined to the valleys scattered throughout the State. The limestone valleys of the southeastern portion of the State are highly developed and Lancaster County is the leading agricultural county in the United States. These rich limestone valleys support farmsteads which cannot be surpassed in any other section of the country. The region is settled mostly with Germans or "Pennsylvania Dutch," who are very thrifty farmers and prosperous.

Land values are high in the best developed sections, but there are large areas of fairly good land where farms can be bought cheaply.

Along the foothills of some of the mountain ranges there is considerable land which is well adapted to the production of fruit and in this industry there are some excellent opportunities.

Land of this character can be bought very cheaply as it is of little value for the ordinary farm crops. When put out to apples, peaches, or in some sections grapes, it yields very satisfactory returns. While grapes are grown extensively in the northwest-part of the State along Lake Erie, the fruit industry of Pennsylvania may be said to be still in its infancy and therefore the present is a good time to invest in land suited to fruit growing. There is a large commercial apple and peach orchard at Boyertown which gives an example of what can be done along this line. Any one contemplating going into the business would do well to visit this place and make a study of the conditions existing there.

The mining regions of the State offer an excellent market for farm produce raised and there are so many mines and they are so well scattered over the State that none of the valleys which contain farming land are very far removed from good local markets. The large cities of the east also afford a ready market for all kinds of farm produce.

The Bureau of Soils of the U. S. Department of Agriculture has made detailed soil surveys of a large number of counties, and a general map has been made of a large portion of the State. It has been found, for example, that certain soils in the State are especially well adapted to the production of apples and that certain types will produce certain varieties of apples better than other types. The Bureau of Soils has prepared reports and maps of all areas surveyed and any of these can be obtained free of cost by writing to the Chief, Bureau of Soils, Washington, D. C.

Dairying, poultry raising, hog raising, tobacco growing and various other lines of general farming can be more extensively developed. The trucking industry in the vicinity of cities can also be profitably extended. For those who contemplate taking up farming in this state it would be well to consider the question of specializing along some particular line or lines and catering to a high class trade so that the highest possible prices may be obtained for the things produced.

Before engaging in any line of farming a careful study should

be made of the conditions in the locality where it is desired to purchase. In looking into the soils and the agricultural possibilities the publications of the State Experiment Station at State College, Pa., will be found very helpful. These may be secured free of cost by writing to the Director, Experiment Station, State College, Pennsylvania.

New Jersey.

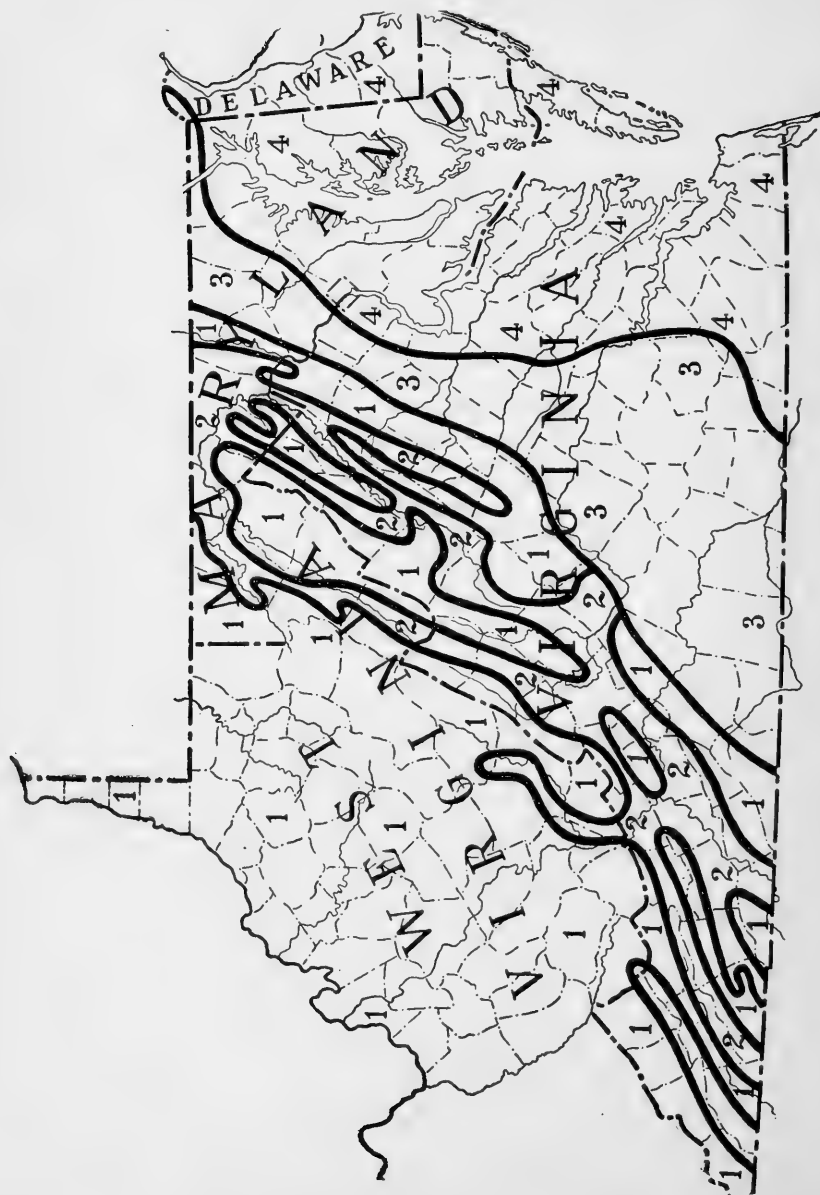
In New Jersey there are three distinct soil provinces represented, all of which are of considerable importance. The most extensive province known as the Coastal Plain Province covers all of the southern half of the State and extends along the Atlantic coast for nearly three-fourths of the length of the State. Throughout this region, and especially along the coast, the surface is low and level, with a gradual rise as the distance from tide water increases. The soils over this portion of the State are for the most part sandy. In many places the sand extends to a considerable depth, while in other regions a sandy clay subsoil may be encountered at from twelve to twenty-four inches. This region is given over to trucking, general farming and fruit raising. The sandy soils are well adapted to a great variety of truck crops and the nearby markets encourage the extensive development of this industry. A number of canning factories are scattered through New Jersey and many peas, beans, tomatoes, etc., are preserved in this way. Of the fruit grown the peach is the most important. Small fruits and bush berries are also raised to a considerable extent. Of the general farm crops grown corn, oats, and hay are the most important. The dairy industry is one of importance in some regions and there is always a ready market for all dairy products. This industry could well be extended as could also the trucking industry.

In the north central portion of the State there is a region covering a considerable area where the soils of the Piedmont Plateau are found. The surface of this section is considerably higher than the Coastal Plain region and the topography is much

more uneven. The soils are derived largely from the weathering and disintegration of igneous and metamorphic rocks and where the surface is not too rough, good agricultural lands are found. The soils as a rule are heavier than in the Coastal Plain and are more generally adapted to general farm crops than to trucking.

The extreme northern part of the State falls within the glacial region and is known as the Glacial Province. The soils vary to a considerable extent in texture as is characteristic of soils of a glacial region. The topography of this region is also much more broken than in the southern part of the State. In the immediate vicinity of the cities, trucking is carried on but in the northwestern corner general farming is of most importance.

Throughout the State as a whole the system of agriculture is more intensive than in many states more remote from good markets. The opportunities which are presented are chiefly along the line of intensive farming. A small acreage highly improved will return better dividends than a large acreage farmed in an indifferent manner. The poultry industry is receiving considerable attention and is profitable. The State as a whole presents numerous opportunities for the higher development of agriculture.



MAP 3.—Soil and Agricultural Map of Virginia, West Virginia, Maryland and Delaware.

Map Legend.

1. Appalachian Mountains. Considerable sandy soil with some loam. Many opportunities for apple culture. Mostly timbered at present.

2. Limestone valleys. Some grazing and general farming. Soil naturally very productive. Best land in these states. Devoted largely to general farming. Some tobacco.

3. Piedmont Plateau Region. Gently rolling to rolling country, large amount of good land, though much of it poorly farmed. General farming, stock, dairying, some fruit.

4. Coastal Plain country. Very level along coast, gradually rising. Trucking extensively developed in places. Peaches in Maryland and Delaware, small fruits and canning crops.

Maryland.

Maryland falls naturally into four distinct provinces from the standpoint of soils and agriculture, as well as from a geological viewpoint.

The mountainous section of the State is adapted to fruit growing, grazing and the raising of livestock, with the possibility of the extension of the raising of cultivated crops on the more level or sloping land. Coal deposits occur at a number of places and mining is carried on to a considerable extent.

Through the rough portion of the State there are a number of limestone valleys. The soils in these valleys are residual from the underlying limestone and belong chiefly to the Hagerstown series. General farming is the chief type of farming followed and dairying is carried on to a considerable extent. The ordinary farm crops, including corn, oats, tobacco, wheat and hay are successfully grown. Alfalfa is also successfully grown, though not to as great an extent as the other hay crops. Some

trucking is carried on and a small amount of fruit is raised. The agricultural communities as a rule are highly developed.

Throughout the Piedmont Plateau the chief soils are those belonging to the Cecil series. This section of the State is not as extensive as either the mountainous part or the Coastal Plain. General farming with dairying in conjunction is the chief type of agriculture followed, though there is some trucking carried on and also some fruit raised.

The Coastal Plain is the great trucking region and the canning industry is developed to a greater extent here than in any other section of the country. Tomatoes and peas are more extensively grown for canning than any of the other crops. A great variety of crops are raised, as the best of markets are within easy shipping distance. The farms are small and the land is worked intensively. Aside from trucking crops the general farm crops are grown, especially in southern Maryland, and tobacco is the leading special crop in many districts. Peaches are an important crop in eastern Maryland and small fruits and berries are also raised to a considerable extent. All of these lines of farming could be profitably extended and there are many excellent opportunities for the man who knows his business and is willing to work hard. Raising special crops and catering to a particular class will often prove very profitable.

Along the coast the canning of oysters and crabs is an important industry.

Delaware.

Delaware consists for the most part of a sandy plain gradually rising from the coast at the rate of only a few feet to the mile.

The soils belong chiefly to the Norfolk series, being light colored sandy material at the surface and underlain by a yellowish sandy clay or by sand which may extend to a considerable depth. On the heavier soil general farming is carried on as the chief line of agriculture, while on the lighter types trucking is the

leading industry. The canning industry is developed to a considerable extent, though markets are close at hand and large quantities of fresh vegetables are disposed of to the large commission merchants.

The opportunities presented in this State are chiefly along the line of intensive agriculture.

Virginia.

The state of Virginia is divided into four distinct soil and agricultural provinces, all of which are outlined on the accompanying map. These various sections are known as the Appalachian Mountain region, the Limestone Valleys, the Piedmont Plateau and the Coastal Plain.

The Mountain region covers much of the western part of the state and the rich limestone valleys are found between the mountain ranges. The soils of the mountains are for the most part sandy and often form only a comparatively thin covering over the bed rock. Where the soil is sufficiently deep and where the slope is not too great, fair crops can be grown, though the amount of agricultural development which has taken place up to the present time is very limited. Probably the greatest opportunities offered for this rough region is the growing of apples. The soils appear to be well suited to this fruit and especially adapted to the production of a few highly prized varieties.

In the limestone valleys the soils are naturally very strong and productive. Many sections now support highly improved farming communities but there are thousands of acres in these valleys where farms can still be bought at comparatively low prices and where the opportunities for making a home and a comfortable income are very good. The soils which are derived from the underlying limestone rock have in many cases been poorly farmed and their productiveness reduced. They are capable, however, of being built up to a high state of fertility. These regions are well adapted to general farming and dairying.

The Piedmont Plateau region lies between the mountains and

the Coastal Plain and is frequently spoken of as the "foot hills." The soils consist chiefly of Cecil clay and Cecil sandy loam which have been formed from the weathering of the underlying igneous and metamorphic rocks. These soils have been farmed for many years in some portions of the state and their producing power impaired by poor methods of cultivation. With proper treatment excellent crops can be raised and wherever scientific methods are being followed at present very satisfactory returns are being secured. The crops grown are corn, oats, tobacco, some wheat, peanuts and a number of truck crops adapted to this section. General farming is the most extensively developed line of farming and excellent opportunities are afforded for its higher development.

The Coastal Plain is the great trucking region of the state and the soils being sandy and early are well adapted to this industry. The markets of the great cities of the east are within easy reach of this whole district and vast quantities of truck are shipped each year. The soils belong chiefly to the Orangeburg and Norfolk series. Peanuts are extensively grown and some tobacco is raised. This region offers opportunities, especially for those who wish to engage in intensive agriculture. Land can be secured cheaply in many localities, and while the soil may be low in fertility it responds quickly to careful treatment.

Throughout the state there are large tracts which were abandoned after the war and allowed to grow up to timber. The second growth is in many places sufficiently large to provide timber of considerable value. These lands can be bought cheaply and on many such tracts farming operations are again being successfully developed.

Considerable coal mining is carried on in the state; in fact the first coal ever mined in this country was taken from a Virginia mine, and the mining communities supply a local market for farm products raised in the rougher parts of the state.

West Virginia.

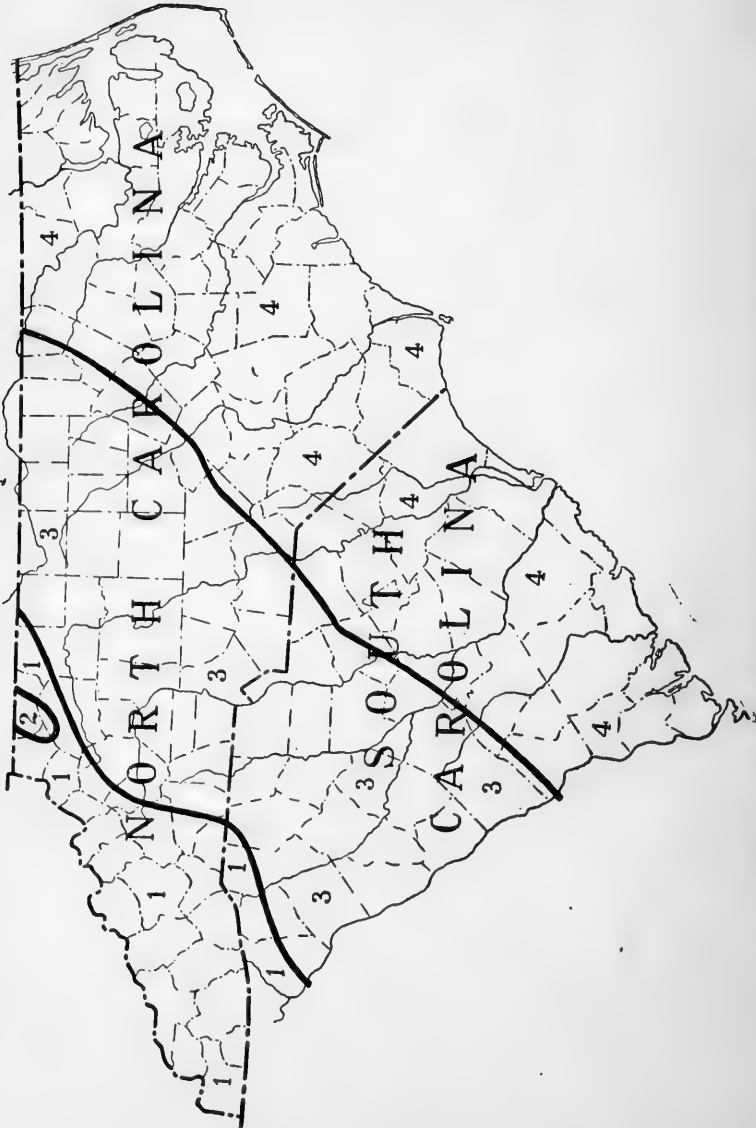
West Virginia is primarily a mining state and the mining of coal is the leading industry. The agricultural products raised within the state at the present time are not sufficient to supply the home demand. There is therefore a ready market for all the farm produce that is grown and a considerable amount is shipped in from surrounding states each year.

By far the greater proportion of the state is rough and mountainous and but poorly adapted to the growing of cultivated crops. These rough sections, however, afford grazing for stock and on the more level places some crops can be grown. The mountain soils are chiefly of a sandy nature and truck crops can frequently be raised with success.

The raising of fruit is coming to be of great promise in West Virginia and much of the land which has heretofore been considered too rough and steep for cultivated crops is now believed to be well suited to fruit growing. Apples and peaches can both be grown successfully and excellent opportunities are afforded for engaging in this industry on a small scale or on a large commercial scale.

In the eastern and southern part of the state there are some limestone valleys where the soil conditions are about the same as found in the limestone valleys of Virginia, though agriculture has not been developed to as great an extent. These valleys are adapted to general farming, dairying and stock raising. Some fruit may also be raised.

The bottom lands along the Ohio River and along streams within the state contain considerable productive land, much of which is not highly improve but which offers opportunities for development.



MAP 4.—Soil and Agricultural Map of North and South Carolina.

Map Legend.

1. Appalachian Mountain region. Average elevation, 4,000 feet. Rough country with some fertile valleys. Thinly settled and but slightly improved. Soils mostly thin.

2. Limestone valleys. Strong, productive soil. Numerous valleys not indicated on map.

3. Piedmont Plateau section. Cotton and tobacco, corn, small grains, general farming. Some fruit and trucking. Soil mostly sandy loam with red clay loam subsoil, naturally strong and productive. Water power plentiful.

4. Coastal Plain region. Mostly sandy and sandy loam soils. Low and flat along coast, gradually rising and becoming more uneven with distance from the coast. Good truck soils. Cotton, corn, tobacco, oats, peanuts, cowpeas. Some rice grown along the coast.

North Carolina.

As indicated on the map North Carolina naturally falls into four distinct agricultural and geological divisions. Each of these presents opportunities for agricultural development which are worthy of consideration.

The mountainous region in the western portion of the state has an average elevation above sea level of about 4,000 feet. The country is very rough and most of the mountain soils are of a sandy nature, though there are numerous valleys where the soil is somewhat heavier and where the land can be cultivated. This region is thinly settled and what agriculture is practiced is very crude. Throughout this section there are numerous localities in the higher altitudes where it is thought the growing of fruit, especially apples, could be extensively and profitably developed. The climatic and soil conditions are favorable, excellent exposures could be selected, drainage conditions are good and por-

tions of the region are traversed by railroads so that shipping facilities would be adequate if localities were selected along the railway lines.

In the western and northwestern part of the state there are a few limestone valleys which are a continuation of the limestone valleys of Virginia. These are of limited extent in North Carolina but form a distinct agricultural province. The soils are naturally strong and productive, though inferior methods which have been followed have in many cases reduced the productivity of the land. These limestone regions are best adapted to the growing of general farm crops such as corn, oats, hay, wheat, etc. Alfalfa can be successfully grown if the soil is put in the proper condition and dairying can be made to produce satisfactory returns.

What is known as the Piedmont Plateau forms the foothills of the Appalachian Mountains and comprises an extensive region of great agricultural possibilities. Portions of it are well developed at the present time and many of the sections were under cultivation long before the Civil War. Where cultivation has been continuous the fertility of the soil has been reduced by exhaustive methods of farming, but most of the soils are capable of being built up to a high state of productivity.

The soils of the Piedmont Plateau region consist chiefly of two types known as the Cecil clay and the Cecil sandy loam. The sandy type consists of from six to eighteen inches of a medium textured sandy loam resting upon a red clay or clay loam. Where the sandy covering is very thin, or where the red clay comes to the surface the soil is known as the Cecil clay. In some localities the heavy subsoil lies at a depth greater than three feet but such variations are of comparatively small extent.

This region produces cotton, tobacco, corn, some oats, a little fruit, some peanuts and truck crops. The soils are adapted to a wide range of crops. The growing of fruit could be extended in many localities and the dairy industry could well be developed. Land values are still comparatively low and the region

offers many excellent opportunities, especially along the line of general farming.

There are numerous streams which furnish an abundant supply of water-power, some of which has been developed and used to run cotton factories and other industries.

The Coastal Plain, which extends from the Piedmont region to the Atlantic Sea Coast, is an extensive region with a level or only gently sloping surface, the higher portion of which has been somewhat eroded by the action of streams. The soils of the region are chiefly of the Orangeburg and Norfolk series. The Orangeburg sandy loam consists of a light colored sand or sandy loam varying from eight to twenty-four inches in depth and underlain by a red sandy clay or clay loam. The Norfolk sandy loam very closely resembles the Orangeburg sandy loam but has a yellow subsoil in place of the red. These are the two leading and most important types in the region, though there are areas of considerable extent where the sand is over three feet deep.

The chief crops grown at present consist of cotton, corn, peanuts, some rice and sugar cane and truck crops. It is the trucking region of the state and the soils are well suited to the production of all truck crops, which find a ready sale in the markets of the cities of the north. While some sections have been under cultivation for 200 years and over, there are extensive areas where the development is very limited, where the land is cheap and where there are good chances for agricultural development. The soils respond readily to careful cultivation and fertilization and can be built up to a high state of productivity. The trucking industry is developing rapidly throughout the region, especially on the sandy loam soils, which can also be profitably developed along the line of general farming.

The climate of the state is delightful, there being quite a range from the coast country to the mountainous region in the west, though extremes in temperature are very rare.

South Carolina.

South Carolina is very similar to North Carolina in its geological formations and also in its agricultural development and resources. One difference is that there are no limestone valleys in the western portion of the state.

The Appalachian Mountain region covers the western part of South Carolina and comprises the roughest and least developed section of the state. The soils of the mountains are chiefly sandy, adapted to potatoes, truck crops, etc., where not too steep and where suitable locations can be found. There are numerous narrow valleys throughout the mountain region where the soils are fairly good but development is slight and all of this region is very thinly settled. As in North Carolina there are numerous localities suitable for the growing of apples, though this industry has not received attention up to the present time.

The Piedmont Plateau region is an extension of the same formation as found in North Carolina and is adapted to the same crops, though more cotton is being grown at the present time. There are localities which are adapted to the growing of peaches, some orchards have been put out and it is probable that the industry will be extended. The fertility of much of the land has been reduced by the constant growing of cultivated crops and the organic matter content of the soil is low. Most of the soils, however, can be readily improved and made highly productive.

The soils of this region, as in North Carolina, consist chiefly of Cecil clay and Cecil sandy loam. The portion of the region next to the mountains is quite rough but becomes more even in topography as the distance from the mountains increases. Land values are still comparatively low and the region offers many opportunities for the development of general farming, fruit growing, dairying and the raising of hogs.

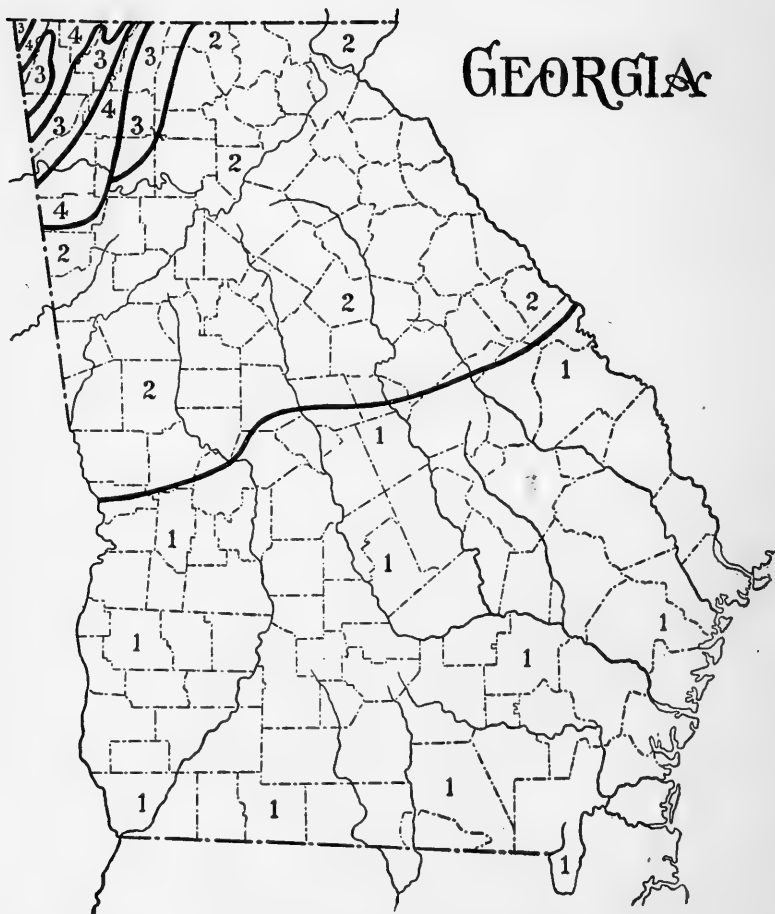
The Coastal Plain country extends from the Piedmont Plateau to tidewater and the coast and comprises an extensive region in which a wide range of agricultural products are raised. There is a gradual slope to the coast and in many places the surface

is level, especially within fifty miles of the ocean. The chief crops grown are cotton, some of which is the Sea Island variety, tobacco, oats, corn, peanuts, cowpeas, rice and truck crops. Much of the land is still undeveloped, values are low and opportunities for investment good.

The leading and most important soil types are the Orangeburg sandy loam and the Norfolk sandy loam. As in North Carolina there are considerable areas where the sand is deep. In the low stretches along the coast the soils are more poorly drained and of a darker color. In general it may be said that the soils of the Coastal Plain are low in organic matter and could be greatly improved by the growing of legumes and by plowing under such crops to supply humus forming material.

This region is traversed with railroads which connect it with the leading markets of the north and east and provide excellent transportation facilities for the handling of the early truck crops. While trucking is being quite extensively carried on, it could well be extended, as could also general farming and dairying, the raising of hogs and the growing of a number of special crops.

The state as a whole presents opportunities which should be carefully considered by those desiring an investment or a home where land is cheap and where excellent returns can be secured for labor expended. The climate is healthful, and while the summers are long, the maximum temperature is no higher than in the states further north. Many living in the Coastal Plain spend a portion of the summer in the mountains or on the Piedmont Plateau where the summers are especially delightful. The winters are very mild and snow is almost never seen. Pastures can be so arranged that stock can graze all year.



MAP 5.—*Soil and Agricultural Map of Georgia.*

Map Legend.

1. Coastal Plains region. Light colored timbered soils. Surface level along coast, becoming more undulating inland. Surface usually sandy with red or yellowish sandy clay subsoils. Some large tracts of deep sand. Cotton chief crop. Corn and small grains are successfully grown. Well adapted to trucking crops, peanuts, cowpeas, etc. Fruit. Diversified farming on increase. Native growth chiefly long leaf pine along coast and short leaf pine in northern part of region. Considerable timber standing—much unimproved land.

2. Piedmont Plateau. Two types of soil extensively developed—a red clay with two to four inches of sandy loam covering it and a gray sandy loam or sand which extends to depth of two or more feet. Surface gently rolling, becoming quite broken in north where it forms the foot hills of the Appalachian Mountains. Cotton, corn, truck crops, fruit. General mixed farming increasing.

3. Light colored timbered soils of Appalachian Mountain region, chiefly residual from sandstone and shale. Soil thin in many places and region rough. Thinly settled and but little improved.

4. Limestone valley soils. Naturally strong and productive. Mostly well improved. General farming chief type of agriculture.

Georgia.

The state of Georgia is divided into two natural divisions known as the Coastal Plain and the Piedmont Plateau sections. The Coastal Plain occupies the eastern and southern parts of the state and comprises two distinct and extensive series of soils described by the U. S. Bureau of Soils as the Norfolk and the Orangeburg series. The Norfolk series consists of gray sands underlain by yellow sand and sandy clay, while the Orangeburg is underlain by red sand and sandy clay. The topography is level along the coast and gradually becomes more undulating and rolling as the distance back increases.

The sandy loam types of these two series, which are very extensively developed in this region, are well adapted to a great variety of crops. Cotton, sugar cane, corn, oats, peanuts, cowpeas and a number of other general farm crops are grown. In many sections trucking is extensively carried on and melons, tomatoes, potatoes, strawberries, eggplant, etc., are extensively grown. The sand types are early, warm soils and will mature crops quickly for early spring markets. They respond readily to fertilization but are apt to suffer from drought during the late summer months.

The boll weevil, the greatest enemy to the cotton plant, has not as yet invaded Georgia and so cotton is still being raised more extensively than any other crop, though diversified farming is receiving considerable attention at the present time. The raising of peanuts is on the increase and more live stock is being raised. The south does not produce half of the pork which it consumes and hog raising can be made very profitable. Peanuts are grown for hog pasture and by harvesting the crop in this way a large amount of labor is saved. The hay supply of Georgia is very limited and raising of cowpeas, vetch, etc., for hay can be made profitable.

Throughout southern Georgia there is still a large percentage of the country undeveloped. Much of it is still in the original forests of long and short leaf pine, while some has been cut over and is now in stumps. This land can be bought for from \$5 to \$15 per acre, depending upon its condition and location, and can be built up into productive land. The soils having the sandy clay subsoil are the most desirable types and are the most readily improved.

The north, northwestern and north central parts of the state are included within the Piedmont section and the soils are largely residual, having been derived from the weathering of igneous and metamorphic rocks. The topography is gently rolling to rolling and hilly and in the northern part it becomes mountainous. The soils of the major portion of the Piedmont Plateau in Georgia are included in the Cecil series and are thoroughly de-

scribed in the reports of the Bureau of Soils. Briefly, the main body of the soil consists of a red clay, which in many places has a covering of sand from a few inches to three feet in depth. Where the sand covering is not too deep it is naturally a strong soil, capable of being brought up readily to a high state of productivity. It is well adapted to all of the general farm crops grown in that region and in some sections the fruit industry has been developed.

There are a great number of large peach orchards in this region and also in the higher portion of the Coastal Plain and in numerous instances these have made their owners independent. One criticism which can be made of the fruit industry in Georgia is that the growers have put out larger orchards than they can properly manage. In many cases the orchards are not properly cultivated, sprayed or pruned and as a result the quality and quantity of the fruit is somewhat lower than it should be. The fruit is often poorly packed and is in poor condition when it reaches the northern markets. Most of the peaches are shipped north and when they reach the market they should be in good condition and in neat, attractive packages, otherwise they will not bring the highest price. The expense in picking, packing and shipping is so great that it does not pay to market a poor grade of fruit for which an inferior price is sure to be obtained. For those who are willing to follow the most scientific methods in fruit culture there is a good opportunity in Georgia.

The raising of pecans is receiving some attention and this may also be made a profitable business.

Taken as a whole the state of Georgia offers many excellent opportunities for those wishing to engage in general farming, stock raising, trucking or fruit growing. The climate is mild, land is cheap and there is a good market for all of the products of the farm and garden. The public roads are better than in any of the other southern states and the school system is being rapidly improved. There is an agricultural high school in every congressional district, something of which few other states in the Union can boast at the present time.



MAP 6.—*Soil and Agricultural Map of Florida.*

Map Legend.

1. General farming region of state. Northern portion chiefly section of gray soils with red subsoils, mostly sandy surface and sandy clay subsoils. Southern portion flat, low country, with sandy soil and native growth of long leaf pine and palmetto. Chief crops, cotton, tobacco, corn, with some sorghum, sugar cane, peanuts, cowpeas, truck crops. Region quite similar to southern and southwestern Georgia.

2. Mixed farming. Some general farming, with trucking on the increase and a small amount of citrus fruit raised, though there is danger from frost.

3. Great citrus fruit belt of Florida. Also important for trucking. Crops grow all year. Winter gardening important.

4. Greatest section for growing truck crops for northern winter markets. Lettuce, tomatoes, celery, asparagus, eggplant, cabbage, melons and numerous other crops successfully grown. Some citrus fruits also raised.

5. Everglades. Extensive region of swamp lands. Portions being reclaimed by drainage, and put under cultivation.

6. Region in which pineapples are chiefly grown.

Soils of most of the peninsula sandy, in many places deep sand.

Florida.

It is doubtful if any other state in the Union has been as extensively advertised throughout the east as Florida. "Ten acres and independence" seems to be a favorite slogan for the real estate promoters. There are many excellent opportunities in Florida but the possibility of securing large yields has been very much exaggerated by many advertisers.

It has frequently been reported that Florida receives its greatest yearly income from the crop of winter tourists. It is doubtful however, if these returns exceed those received from the sale of "ten acre farms." The greatest agricultural industry of Florida consists of raising truck crops and citrus fruits. The vegetables grown in the winter and early spring are marketed in the cities of the north and east and very profitable returns are often, though not always, secured.

The soils are almost entirely of a sandy nature and in many places the sand extends to a great depth. In other places there is a sandy clay sub-soil at from eighteen to thirty-six inches below the surface. This latter is the most desirable ex-

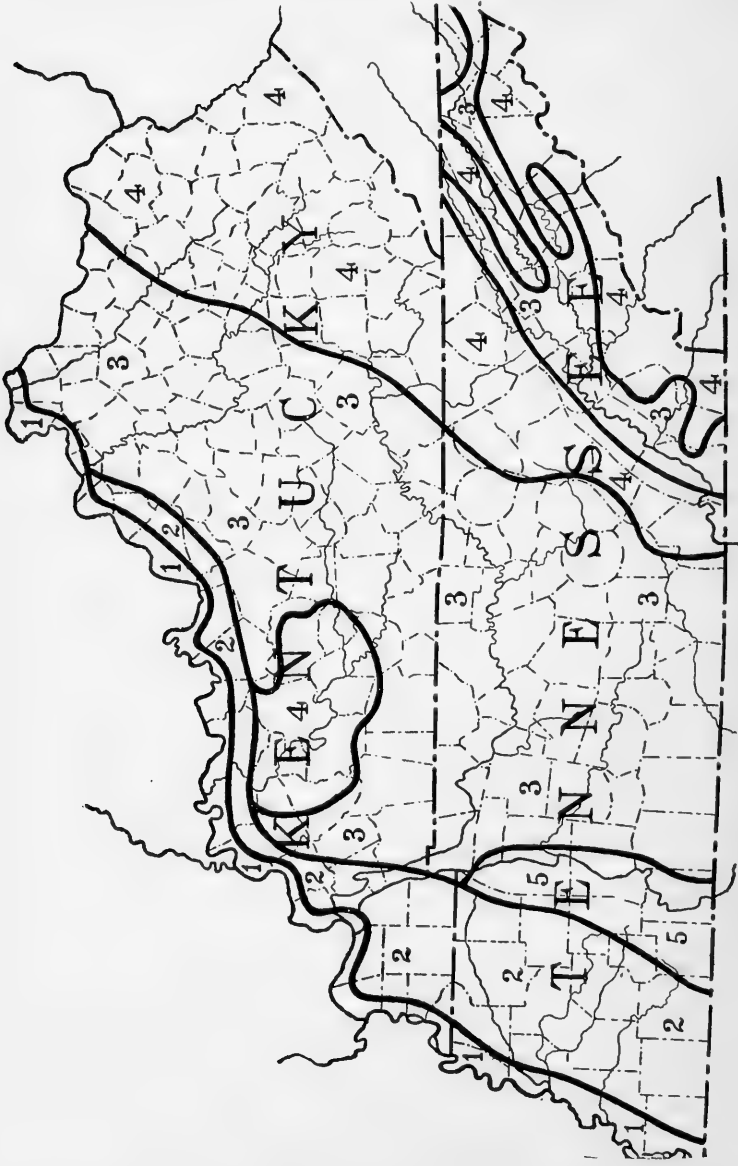
tensive type and is known as the Norfolk sandy loam. It frequently happens that the surface indications are nearly the same on both kinds of soil and the inexperienced are sometimes sold the deep sand when they could as well select the better soil, were they familiar with the conditions. In lowlying places, along stream courses and over poorly drained tracts the soil frequently has a dark or nearly black color, due to the presence of organic matter. Many of the tracts in the extreme southern part of Florida are of this nature and before large crops can be raised, it is necessary to install drainage systems and frequently arrange for irrigating the land also, since it is too wet in the early spring and too dry later in the summer. When such systems have been properly installed there is almost no limit to the amount of truck which can be raised. The condition amounts to the same as having an equal area under glass in a forcing house. This is an expensive undertaking and requires experience as well as money. Commercial fertilizers are necessary if the best results are to be obtained.

There are large tracts of land which are well drained, having a sandy clay subsoil and well suited to truck and citrus fruits, which can be secured cheaply, and on which very good crops can be raised. In selecting land, however, the purchaser should examine the land in person and not trust to the word of any one. Strawberries, lettuce, eggplant, cabbage, melons, etc., are raised extensively. Oranges and grape fruit are confined chiefly to the southern half of the state since frosts frequently occur in the northern portion. Considerable tobacco is grown in the western part of the state and pineapples are extensively raised in some sections farther south. Some general farming and cotton raising is carried on though not very extensively.

The climatic conditions which prevail in Florida are delightful, the winters are very mild and as there is always a breeze in the summer the heat is not intense. While there are good opportunities in Florida for establishing a home on a small acreage,

those who contemplate moving to that state should first visit that region and make a careful study of conditions, getting their information first hand, instead of from the advertisements of real estate promoters.

Land can be secured very cheaply and it does not cost much to live in that warm climate.



MAP 7.—Soil and Agricultural Map of Kentucky and Tennessee.

Map Legend.

1. River flood plains province. Alluvial soils, very productive but subject in places to overflow.

2. Loessial soil province. Soil chiefly a silt loam. Slopes to the west. General farming, trucking, small amount of cotton. Soil readily built up to be very productive.

3. Limestone valleys and uplands province. Soils from limestone rock, naturally strong and productive. Highly improved. General farming, horses, mules and some cattle and hogs. Includes the "blue grass" country. Some dairying. Tobacco is an important crop.

4. Appalachian mountains and plateaus. Soils thin, region mountainous. Some grazing and a little farming in the valleys. Many orchard possibilities. Coal in mountains.

5. Coastal plains province. Mostly sandy soils with sandy clay subsoils. Some trucking and general farming.

Kentucky.

This state falls into four soil and agricultural provinces. The extreme eastern portion of the state is occupied by the Appalachian mountains. This region is very rough, broken and mountainous and throughout much of its extent is but poorly suited to agricultural development. There are a number of valleys and considerable areas where its surface is not too steep to be cultivated where cultivated crops can be successfully grown but only a very small percentage of this land is improved at the present. The greatest possibilities offered by this rough country are along the line of fruit raising. There are numerous localities where the growing of apples and peaches could be profitably carried on and at the present time some orchards are to be seen in the region.

In the northwestern portion of the state is a small area which

would be classed in the same province as the above, but the surface is less broken. It is but slightly developed, however and is not as well suited to general agriculture as many other portions of Kentucky.

Throughout the central and southern portions of the state is an extensive area in which the soils are derived chiefly from the underlying limestone and this region is included within the limestone valleys and uplands soil province. It includes the "blue grass country" and the most highly improved portion of Kentucky. The soils are naturally strong and productive and the agricultural communities are thrifty, progressive and prosperous. The chief crops are corn, small grain, tobacco with the raising of fine stock as a very important branch of agricultural industry. The Kentucky horses have a wide reputation and most of them come from this region. Cattle and hogs, as well as horses, are raised and the dairy industry is an important one in a number of sections. Land values are higher than in other portions of the state. There are good public roads throughout the region, excellent railroad facilities, and splendid opportunities for the higher improvement of intensive agriculture.

In the extreme western part of the state there is an area which falls within the loessial soil province. In this region the soil consists chiefly of silt loam. It is adapted to a wide range of crops and aside from the general farm crops common to the state and the raising of tobacco, the trucking industry has been developed to a considerable extent. The land can be readily built up to a high state of productivity and many good opportunities are presented in this portion of the state.

The bottom lands along the Ohio and Mississippi rivers and streams with the state are included within a separate division, known as the river flood plains province. The soils are of alluvial origin and very productive, though there is always some danger from flooding, in case the levees should break. When fully protected these lands make very desirable farming communities.

Tennessee.

Because of the soil and climatic conditions prevailing in Tennessee the state is adapted to the production of a wide range of crops. All of the staple crops common to the north and some of those common to the south are successfully grown. In addition to these general farm crops, the trucking industry has been extensively developed in certain localities.

In the extreme western part of the state there is a considerable area of bottom land along the Mississippi river where the soils are very fertile and capable of producing large crops. The greater part of the lowland is protected by levees but the natural drainage is sometimes deficient, and some of the land may be flooded at times from the backwater from streams flowing into the Mississippi when that stream is at or near the flood stage. The soils of this region are all alluvial in origin and quite high in organic matter. They are more productive than the upland soils but on account of the danger from flooding if the levees should break but few permanent homes are established in the lowlands.

There are also extensive areas of bottom land along the rivers within the state and in many places these lands are highly developed.

The west end of the state outside of the bottom lands is covered with a soil formation known as loess. The soil of this region is a silt loam, very uniform in texture, friable in structure and possessing characteristics which permit it to be eroded more readily than other soils. It is a soil which works readily and responds quickly to careful treatment. It can be readily improved to a high state of productivity. This section of the state is devoted to the raising of general farm crops, cotton, tobacco and also to trucking. It is probably a better truck soil than can be found elsewhere in the state and this industry is highly developed at a number of places. Strawberries, tomatoes, potatoes, and melons are among the special crops grown profitably. In connection with

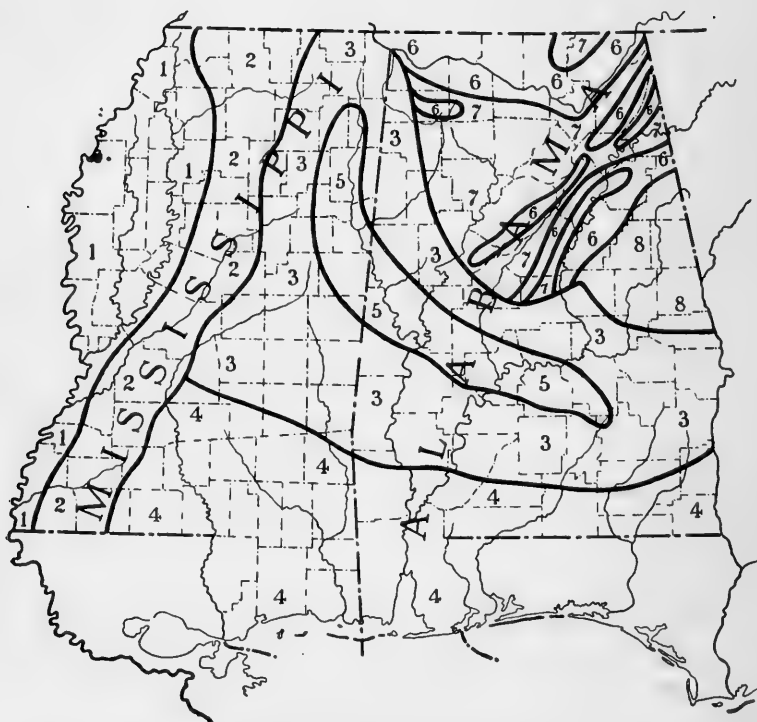
trucking, the canning industry has also been established to handle a portion of the crops. Land in this district can still be bought at a reasonable figure and many excellent opportunities are afforded.

The limestone valleys and uplands comprise a very extensive and very important portion of the state. The uplands are found chiefly in the central part of the state while the limestone valleys occur chiefly in the intermountain regions in eastern Tennessee. General farming is the chief type of agriculture followed. Tobacco is raised quite extensively. The raising of horses, mules and cattle receive considerable attention, and dairying and hog raising are also important. The soils are derived from the underlying limestone and are naturally productive and strong lands. Inferior methods of cultivation have in a number of sections somewhat reduced the fertility but by following up-to-date methods this can be readily restored. These limestone regions are as a rule highly improved, well settled and show a condition of thrift and prosperity to prevail among the farmers. Land values are higher than in other portions of the state.

The extreme eastern part of the state is rough and mountainous and outside of the valleys it is but poorly adapted to growing cultivated crops. The soils are mostly sandy, shallow and rocky, and it is difficult to get to market from remote sections. There are many localities where the fruit industry could be developed, especially the growing of apples, and the region is better adapted to this line of farming than to any other. Some orchards have been set out, but a number of these have failed on account of not being given proper care. With careful management from the selection of the site and varieties to be grown to the packing and marketing there is no doubt but that the growing of apples could be made very profitable. In addition to apples, grapes could also be grown and peaches would probably be successful. Where close to shipping points, and the surface is not too rough, some trucking can be carried on. Much of the mountain land provides

fair grazing and the raising of stock could doubtless be profitably extended. Land values are very low.

There are extensive deposits of iron throughout eastern Tennessee and the mineral and the timber are the two factors which determine the value of the mountain lands.



MAP 8.—*Soil and Agricultural Map of Mississippi and Alabama.*

Map Legend.

1. Yazoo-Mississippi Delta. Dark colored alluvial soils naturally very productive. Cotton chief crop. Diversified farming increasing. Well adapted to corn, grains, alfalfa and to numerous truck crops. Mostly protected by levee but drainage in places very deficient. Considerable areas still in timber.

2. Loessial region, including light colored timber soils, chiefly silt loam. This soil responds quickly to careful treatment, but

erodes rapidly on unprotected slopes. Good trucking soil, also good general farming soil.

3. Coastal Plain region. The northern part north and west of the black Prairie is called the Region of Gravelly Hills, with light colored sandy loam the most common type of soil. Original timber chiefly short leaf pine. Cotton the chief crop, though corn is also grown; also adapted to fruit and truck crops in many places. The surface varies from small level table lands to quite hilly country. Considerable timber still standing. Portion south of Black Prairie known as Upper Long Leaf Pine Belt. Mostly sandy loam with areas of deep sand. Surface mostly gently rolling to rolling. Original growth chiefly long leaf pine. Cotton and corn chief crops. Also adapted to peanuts, melons, potatoes, peaches, figs and other orchard crops.

4. Coastal Plain—Lower Long Leaf Pine Belt. Nearly level, as a whole, but uneven enough for good surface drainage. Sandy loam and sand chief types with some areas of heavier soils. Trucking leading industry along gulf. Corn and oats do well. Some cotton is grown also. Sweet potatoes, peanuts, cowpeas, beans, etc., do well. Sorghum and sugar cane are successfully grown.

5. Black Prairie region. Chiefly clay loam soils derived from limestone. Very productive. Adapted to alfalfa, corn, cotton and all general farm crops and also to stock raising. Mostly under cultivation. The best farming land in the south.

6. Residual Limestone region. Includes Tennessee valley and smaller valleys. Strong, productive soil. Surface light colored, mostly silt loam. Good farming lands.

7. Cumberland Plateau region. Much of surface very hilly to mountainous. Large portion still in timber. Soils mostly sandy loams. Little agricultural development. Extensive mineral deposits.

8. Piedmont Plateau region. Soils red clay and gray sandy soils. Surface rolling. Heavy soils; good general farming lands. Lighter types good trucking and fruit soils.

Alabama.

Alabama is taking the lead among many of the southern states in the development of her agricultural resources. Agricultural high schools are being established and farm demonstration experts from the Bureau of Plant Industry, U. S. Department of Agriculture, are stationed in nearly every county. It is the business of these experts to give advice to all interested in farming as to the best methods of cultivation, adaptation of soils to crops, best crops to grow, etc. This work is done in co-operation with the Alabama Department of Agriculture and Industries.

The majority of the soils of the southern part of the state are of a sandy nature. In some places the sand is deep, while over large areas there is a sandy clay sub-soil at from fourteen to twenty inches below the surface. As classified by the U. S. Bureau of Soils these soils belong chiefly to the Orangeburg and Norfolk series. As a whole the region covering southern Alabama is well adapted to the production of truck crops, which mature from February to May, and which are shipped to the markets of the north, chiefly Chicago, St. Louis, and Cincinnati. Among the crops grown, cabbage, peas, tomatoes, melons, strawberries and potatoes are the most extensively cultivated at present. Pecans and figs are grown to some extent and give promise of profitable returns. In the extreme south the Satsuma orange is being planted in many places and this seems to be a safe proposition. During the winter of 1910-11 the temperature dropped to 18 degrees at Mobile and was below freezing for four consecutive days, yet the orange trees were not damaged. Cotton becomes an important crop farther north but this staple is not grown along the gulf coast.

Most of the land in southern Alabama is still undeveloped. A large part of it has been cut over (though there is still considerable fine timber), and is now stump land. In selecting farms in this region the soil should be carefully examined. That having a sandy clay sub-soil, and good surface drainage is the best. Where the sand is several feet deep crops are apt to suffer from

drought, especially late in the season and any fertilizer which is applied will rapidly be leached out. The sandy soils are very early and often a fair crop can be secured before the dry weather comes on. By proper management three, and sometimes four crops can be taken from the best soils during a period of twelve months. Cabbage can be set out in November and marketed in February and March. This crop can be followed by early potatoes, and later by corn. Cowpeas or peanuts can be sown in the corn at the last cultivation and after the corn is cut the remaining crop can be pastured or cut for hay. A large number of combinations similar to this can be successfully grown. Land in southern Alabama which is undeveloped can still be bought for from \$4 to \$20 per acre.

What is commonly spoken of as the Black Prairie Belt in west central Alabama, is the richest agricultural section of the state. The soil consists of a black clay loam derived from the weathering of limestone (Selma chalk). This soil is classified by the Bureau of Soils as belonging to the Houston series and it is naturally one of the most productive soils in the country. It is well adapted to cotton, corn and all general farm crops, but the most important factor is the fact that it is also especially well adapted to the production of alfalfa. This legume grows very well without being inoculated and yields on the average three or four cuttings every year. A minimum yield of three tons per acre, per year can always be counted on. As high as five and six tons per acre have been secured. Alfalfa sells on the markets of Mobile and Birmingham for \$16 to \$22 per ton and there is always a ready sale. The industry is still in its infancy, but the raising of alfalfa in conjunction with the breeding and feeding of livestock offers one of the best opportunities to be found in any agricultural region.

Dairying could also be made a very profitable industry. Land values are still low, considering the producing power of the soil, though prices are higher than elsewhere in the state. First class land cleared and under cultivation in the Black Belt can be

bought for from \$25 to \$50 per acre. At these figures it is without doubt the cheapest land for general farming in Alabama.

The Tennessee Valley, in the northern part of the state, is another important agricultural region which is devoted chiefly to general farming and cotton. While much of the land is cultivated, there are still extensive areas which are not highly developed.

The northeastern part of the state is rough and mountainous, and most of the farm land is confined to the valleys. Some of the slopes may sometime be planted to orchards as there are a number of good locations throughout that region.

Throughout the entire state, agricultural interests are being advanced and development is rapid. Birmingham, the center of the steel industry of the south, and Mobile, the states sea port are both growing and enterprising cities which furnish a good market for large amounts of farm produce. Aside from its agricultural resources, Alabama is an important mining state and coal and iron are produced in large amounts. There is a large amount of undeveloped water power in the state which will someday be harnessed to run varying lines of industry. The state is well supplied with railroads and the transportation facilities are adequate for the demands of a higher development than exists at present.

Taken as a whole, Alabama offers excellent opportunities for higher development along almost all lines of agriculture. The Bureau of Soils, U. S. Department of Agriculture, is co-operating with the Alabama Department of Agriculture and Industries in making a soil survey of the entire state. Practically half of the state has been completed. The soil survey reports covering this work can be secured for the counties completed, free of charge, and any one thinking of investing in Alabama should consult these publications.

Mississippi.

The most important agricultural province in Mississippi at the present time is what is commonly known as the Yazoo-Mississippi Delta. It occupies a strip of country along the western border of the state, though the largest development lies between Vicksburg, Miss., and Memphis, Tenn. It varies in width from a few miles in the south to about fifty miles in the north. The soil is entirely alluvial in origin and varies in texture from a fine sandy loam immediately along the stream courses to a clay in the interstream areas. It is a very fertile region and produces more cotton than any other area of equal extent in the world, yet, considering this fact, there is considerably less than half of the region under cultivation. A large proportion of the delta is in need of drainage and a number of large drainage districts have been established. When this entire area is cleared, drained and properly farmed it will become the most productive area of such extent in the world. It is well adapted to cotton, corn and all general farm crops and alfalfa is being successfully grown in a number of places. The sandy tracts are suited for truck raising. There is still considerable good timber in the delta but it is being rapidly removed. The Mississippi delta offers many good opportunities along agricultural lines. Land is cheap, ranging in price from \$10 to \$50 per acre.

Bordering the delta and extending the entire length of the state is a strip of country from twenty to thirty miles in width which is known to Geologists as Loess, and commonly spoken of as the cane hills and flat hills country. The soil is a light colored silt loam, very fine and smooth and very easily eroded. Much of it is badly cut up by ravines and gullied until it is of little use for cultivated crops. Where the hill tops are flat or where the topography is not broken the soil is capable of being highly developed. It responds quickly to fertilization and to proper methods of cultivation and in a few years can be built up into a productive soil. It is well adapted to potatoes, cab-

bage, strawberries, and all truck crops and cotton and corn do fairly well. Land in this section is very cheap.

What is commonly spoken of as the Northeast Prairie or as the Black Prairie Belt is a very important agricultural region, though of comparatively small extent. Roughly speaking it extends from Tupelo south to Macon and then swings east into Alabama where it forms the Black Prairie region of that state. The predominating soil throughout this prairie is a black clay loam belonging to the Houston series. It is derived from the underlying limestone and extends to a depth of from three to twenty feet. While cotton and corn have been raised here since before the war, the land still produces good crops. Nothing has ever been returned to the soil in the form of fertilizer and the methods followed have been wasteful. By following up-to-date methods of farming this land can readily be made to produce as large or larger crops than are secured from the black soils of Illinois or Iowa. This soil is very well adapted to alfalfa and the crop is being extensively introduced. It produces from three to five tons per acre which sells in Mobile and Birmingham at from \$16 to \$22 per ton. Grown in conjunction with the raising of livestock, alfalfa raising offers an opportunity which is seldom equaled anywhere. Land of this kind can be bought for from \$25 to \$50 per acre depending on the location and improvements. It is a very good investment at this price. Northern people are buying up this land rapidly and the price is constantly advancing. This region in conjunction with the prairie in Alabama is the only limestone prairie section in the United States which is not highly developed and where prices are still comparatively low. If this land were in Illinois it would sell for from \$125 to \$200 per acre. Considering the rich soil, the healthfulness of the region, the mild climate, the good water supply, the low price of the land, and cheap labor, it would be difficult to find a locality in which more desirable opportunities are presented for one wishing to engage in practical agriculture.

The portion of the state between the Prairie and the Loess region is a short leaf pine country. The topography is rolling to hilly with a narrow strip of "flat woods" extending from north to south. In the "flat woods" the soils are heavy, but over the remainder of the section it is sandy with a sandy clay sub-soil. Comparatively little development has taken place and the region does not present opportunities equal to those in the delta or in the prairie. Many of the slopes are suited to fruit culture and this industry will doubtless be developed in time. Land is very cheap and large tracts can be bought as low as \$5 per acre and on up to \$25.

In the southern part of the state is the long leaf pine section and but little agricultural development has taken place. Lumbering and turpentine producing are the two leading industries, though agriculture is just beginning to come to the front. The soil is chiefly sandy and adapted to truck. It is identical with the southern Alabama country.

The U. S. Bureau of Soils is co-operating with the Mississippi Geological Survey in making a soil survey of the entire state. Reports covering the work thus far completed can be secured free of cost. The excellent opportunities offered in Mississippi and the various kinds of soil found are fully described in these reports and these publications should be consulted by all interested in Mississippi.



MAP 9.—*Soil and Agricultural Map of Michigan.*

Map Legend.

1. Region of dark colored soils formed in old lake beds. Surface nearly level, and drainage often deficient. Soils mostly clay loam and silty clay loam, with numerous small patches of sand. Good general farming country. Corn, hay, small grains raised. Sugar beets important special crop. In Upper Peninsula considerable red clay. Corn not certain to mature every year. Dairying important.

2. Level or slightly undulating sandy or gravelly plains, including numerous sand dunes along lake shores. Has lower agricultural value than heavier soils and must be carefully handled. Truck crops, potatoes, etc., are successfully raised on best portions.

3. Gently rolling ground moraine with loams and clay loams predominating, including numerous morainic areas in which soil varies from sand to clay. Region as a whole good general farming land. In Southern Peninsula it is well improved with corn, small grains, hay, dairying and stock as the important factors. Considerable fruit, especially apples, also raised. In Upper Peninsula, it is but slightly developed but the soil is good and the region is settling rapidly. Numerous marshes.

4. Gently rolling ground moraine in which sandy soils predominate, including numerous morainic areas which are rough and in which the soil varies from sand to clay, but is mostly sandy. General farming chief type of agriculture. Corn, oats, barley, hay, dairying, stock. Large amount of fruit, especially along shore of Lake Michigan where the peach industry has been extensively developed. Apples, cherries, pears and plums also raised successfully. Numerous marshes.

5. Region where soil is thin and the underlying rock comes close to surface and outcrops frequently. Low agricultural value.

6. Swamp areas. Very numerous but nearly all too small to indicate on such a map. Many may be drained and reclaimed. Celery and peppermint are two important crops raised in the state on reclaimed swamp land.

Michigan.

Michigan is greatly influenced by the large bodies of water with which it is nearly surrounded and by which it is divided into two peninsulas. The northern is the smaller and comprises something less than two-fifths of the area of the state. The types of agriculture followed frequently depend to a considerable extent upon the proximity to the lakes.

The Northern Peninsula is but slightly developed except in Menominee County to the south and in Chippewa County to the east, where the country is very well settled and prosperous farms established. The agricultural resources and possibilities of this region are but little known and but slightly appreciated even by the people within the state.

The soils are mostly loams, sandy loams and silt loams, with a considerable tract of sand in the central portion of the peninsula and bordering Lake Superior in places. The original timber on the sand was largely pine, while on the sandy loam and on the heavier soils the growth was chiefly maple, hemlock and birch, with cedar, spruce and tamarack in the swamps and poorly drained areas. All of the pine and much of the hardwood has been removed and the region is now largely a cut over country with a second growth springing up. The hardwood which remains is being rapidly cut, and the farmer is following in the path of the lumberman.

The growing season is short but plant growth is extremely rapid during the summer months. Corn is not considered a safe crop, though it frequently matures and more hardy varieties are being improved each year. Corn for the silo can be grown and clover and timothy do especially well. Oats, barley and wheat can be grown successfully and peas, roots and potatoes

are well suited to the soil and climate. Sugar beets yield a higher sugar content than further south. Apples are being grown successfully and there is no reason why the apple is not as well adapted to favored localities along the Superior shore in Michigan as it is to the Bayfield Peninsula in Wisconsin. Strawberries and all bush berries and cherries can also be raised with profit. The mining towns of the region afford excellent markets for all farm produce. The dairy industry will probably come to be the leading type of agriculture and this will be carried on in conjunction with general farming. Land values are still cheap and the opportunities for securing good land and making a home at little expense are still within the reach of those of limited means.

The Southern Peninsula supports several types of agriculture, though frequently two or more of these are combined on the same farm. The western portion of the state bordering on Lake Michigan, and especially the southern half of this strip, is known as the Michigan Peach Belt. The Michigan peach is known throughout the country and is a source of large revenue to the growers. Apples are grown all along the west shore of Michigan and throughout the south half of the southern peninsula. Grape growing is centered about Lawton, celery growing about Kalamazoo, and the growing of peppermint in marshes throughout the southern portion of the state. About one-third of all the peppermint oil in the world is produced in Michigan. The growing of potatoes is a special industry of importance, developed in some of the counties in the northern part of the southern peninsula. Sugar beets and beans are also important crops.

The type of agriculture which is most extensively developed, however, is general farming, with dairying as the most important branch. Butter and cheese are extensively produced and the retail milk trade in the cities and towns requires the keeping of large numbers of dairy cows. The raising of horses, cattle, sheep and swine, and the breeding of fine stock receives consid-

erable attention. Corn, oats, wheat, rye, barley and hay are the chief general farm crops.

The southern half of the southern peninsula is much more highly developed than the northern half, though development in the northern section is now advancing quite rapidly. The major portion of the northern region has a sandy loam soil, with some tracts of heavier land and also considerable areas of sand which has a low agricultural value. In selecting farms in this region care should be exercised and no land should be bought without first carefully inspecting it. The sandy hardwood land is considerable better than the sandy pine land, although there may not be much difference in the surface appearance of the two classes of land.

The soils of the southern part of the southern peninsula vary from sand to clay and frequently several types may be found in the same field. The heavier soils predominate, however, and are well adapted to all the general farm crops grown at present. Alfalfa is being introduced and every farmer should make an attempt to grow it, starting on a small scale.

Michigan is very well located in regard to markets, has an abundant supply of pure water in lakes, streams and springs, and an annual rainfall of about thirty-two inches, which is normally well distributed throughout the year. Many people are attracted to the state each year on account of the beautiful lakes, delightful climate and good fishing. Agriculture offers many good opportunities and those looking for land in which to invest, or for a farm on which to establish a home could well afford to visit the state and make an investigation of conditions.



MAP 10.—*Soil and Agricultural Map of Wisconsin.*

Map Legend.

1. Glaciated soils containing limestone material. Light colored silt loam (Miami silt loam) predominating type. Black silt loam (Carrington silt loam) also extensively developed throughout prairie regions. Entire region excellent farming land and highly improved. Dairying leading industry. Corn, hay, oats and barley leading crops. Alfalfa quite extensively grown.

2. Sandy soils within glaciated limestone region, chiefly Miami sandy loam. General farming, very little dairying, potato raising and some trucking. Considerable unimproved land in northern part. All hardwood land.

3. Sandy soils **glaciated but outside of the limestone region** chiefly Coloma sandy loam and Coloma sand. Good potato soil and trucking land. General farming on heavier phases. Some dairying. All hardwood land. Considerable unimproved land in northern part of state.

4. Areas of deep sand, mostly Jack pine land. Low agricultural value and but slightly improved at present.

5. Loams and silt loam soils in glaciated region having no limestone present. Original timber hardwood with some hemlock, white and Norway pine in places. Somewhat stony in places but very good general farming land. Well adapted to clover and alfalfa can be successfully grown. Corn can be matured. Dairying rapidly increasing. Considerable unimproved land. Values very reasonable at present but prices of land rapidly increasing.

6. Silt loam soils of the **unglaciated region** of loessial origin. Mostly Knox silt loam. Topography rolling to hilly. Dairying an important industry. Good general farming soil. Numerous good locations for apple orchards.

7. Largely residual sandy loams, mixed in places with loessial silt. General farming, dairying, some trucking and small fruits.

8. Flat sandy area with numerous marshes. Original timber chiefly pine. Soils require very careful handling to produce good yields. Low agricultural value.

9. Areas of red clay. A strong productive soil, though somewhat difficult to handle. General farming and dairying. Alfalfa successful where drainage is adequate. Good grass land.

Wisconsin stands for progress and achievement. Along the line of agriculture this state offers opportunities which are equaled by few, if any, of the other states in the Union. Wisconsin leads all other states in the development of the dairy industry. In 1909 there were 6,235 creameries in the United States and of these 1,000 were in Wisconsin. At the same time there were 3,846 cheese factories in the United States, of which 1,784 were in Wisconsin.

In the variety, quality and yield per acre of crops the state occupies a front position. The following summary shows Wisconsin's standing among the states producing sufficient quantity of the various crops to warrant consideration. The irrigated states are not included for the reason that the cost and labor of irrigation are not clearly enough determined so that an accurate comparison can be made. The rating for corn, barley, oats, spring wheat, potatoes and flax are for the ten years 1901-1910 inclusive, while the others are from the latest tables, all being from the statistics of the United States Agricultural department: Crop Reporter and Yearbook:

Flax—Of all states producing flax during the ten year period ending 1910, Wisconsin stands first.

Barley—Among the nine states producing 1,000,000 bushels or more during the ten year period ending 1910, without irrigation, Wisconsin stands first.

Oats—Among the sixteen states growing 10,000,000 bushels or more during the ten year period ending 1910, without irrigation, Wisconsin stands first.

Spring Wheat—Among the seven states producing more than 1,000,000 bushels of spring wheat, without irrigation labor and expense, during the ten year period ending 1910, Wisconsin stands first.

Potatoes—Among the eight states producing 10,000,000 bushels or more per year during the ten year period ending 1910, Wisconsin stands second. Led only by a state using an enormous amount of commercial fertilizer.

Rye—Among the thirteen states producing 500,000 or more bushels of rye in 1909, without irrigation, according to the latest ten year tables, Wisconsin stands fourth. The three states leading Wisconsin do so by a very slight margin.

Corn—Among the twenty-five states producing 25,000,000 bushels or more during the ten year period ending with 1910, Wisconsin stands fifth. The leading state, Ohio, leads Wisconsin by only 2.4 bushels, Indiana by 1.5, Illinois by 1.3 and Pennsylvania by 1.1.

Hay—Of all the states not using irrigation, according to the latest tables for a ten year period, Wisconsin stands fifth.

Sugar Beets—The statistical tables indicate that Wisconsin leads all non-irrigated states and comes within a ton per acre of equaling the average of the irrigated states.

No state produces more high grade, pure bred seed for shipment to all parts of the world than Wisconsin. No state has better facilities for educating the farmer and this means that Wisconsin will continue to raise choice seed, fine stock and make still greater strides along all lines of agriculture.

Measured by the standard of markets, Wisconsin is probably without a rival in the advantage of location. Bounded on the north and on the east by two of the largest lakes in the world; on the west by the longest River, which flows through a rich, prosperous country to the Gulf, thereby with its water-ways reaching nearly half of the population of the entire country. On its southern boundary adjacent to Chicago, one of the greatest market places in the world; adjoining on the west the twin cities' grain milling center; possessing in its metropolis one of the largest ports in the country, and with fifteen million people living in the state and in the states bordering Wisconsin, nothing more could be asked or afforded geographically.

The question of water is an important consideration and Wisconsin is blessed by having an abundant supply of pure water in the form of thousands of lakes, rivers and springs. During the World's Fair at Chicago thousands of visitors quenched their thirst with water piped directly from the Waukesha Springs of the Badger State. Wisconsin has a generous amount of rainfall, well distributed throughout the year so that crops are never a complete failure on account of lack of moisture.

Wisconsin has a climate which is invigorating, bracing—the kind that makes a man want to do things. The winters are cold and frequently severe, but the summers are mild and very pleasant. Because of the delightful climate and the many beautiful lakes, Wisconsin is rapidly coming to be the summer resort of the middle west.

Wisconsin's greatest resource, however, is in the soil, and the marked progress which is being made throughout the state along the line of agriculture is due largely to the scientific methods which are being applied to the growing of grains, fruits, stock and the management of the soil.

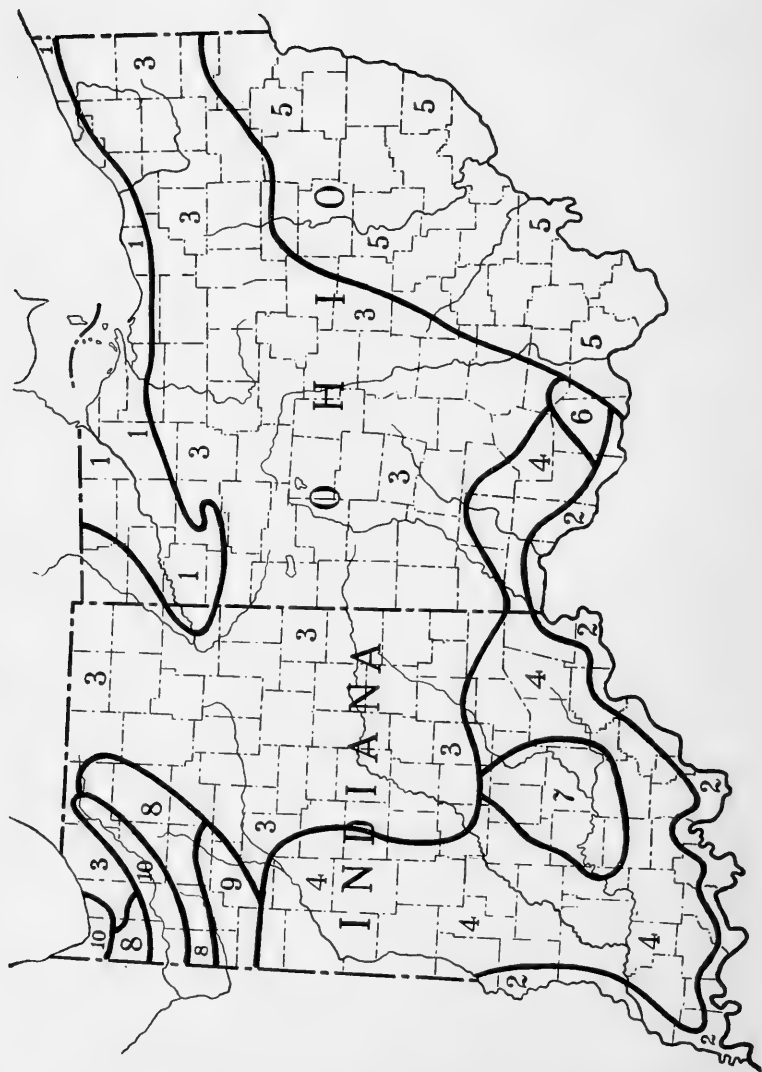
The southern half of the state is well settled, highly improved and embraces some of the finest farming land to be found anywhere. Land values are high—higher than in Michigan for example, but not as high as in many parts of Illinois, and the methods of farming followed are considerably above the average. While the soils are subject to wide variations, the predominating type is a silt loam. In the regions which were originally timbered this soil is light colored, while on the prairies it is black. The soil is remarkably productive and responds quickly to careful management. Numerous areas of marsh land will add great wealth to the state when drained and reclaimed.

The northern half of the state is a vast empire of undeveloped resources. The soils range from sandy loams to silt loam and red clay, with the silt loam predominating. There are also some areas of sand which have a low agricultural value, but these tracts are of much smaller extent than the desirable lands. The pine has all been removed and also the greater proportion of the

hardwood. Most of it is a cut-over country with the farming opportunities just beginning to be appreciated. Land values range from \$3.50 per acre up, depending upon the location, the character of the soil, surrounding development, and the improvements on the land. Clover and grasses do remarkably well and have a flavor which is imparted through the dairy cow to butter and cheese to such an extent that these products from Northern Wisconsin are coming to be recognized as of the finest quality. Corn can be matured in all parts of the state, though in the northern portion it does not always escape being damaged by the frost. It is grown for ensilage throughout all sections. Oats, barley, wheat, sugar beets, peas and potatoes are among the crops which grow successfully and with profit in all parts of northern Wisconsin. The dairy industry is taking the lead and is the most important type of farming, in the newly developing regions as well as in the old established communities. Alfalfa is coming to be a very important crop and will greatly assist in the higher development of the dairy industry.

On the Bayfield peninsula on Lake Superior and in Door County, bordering Lake Michigan, the growing of apples, cherries and berries is receiving considerable attention, and is meeting with very good success. The southwestern portion of the state is also considered well adapted to apple culture and the fruit industry offers many opportunities. The growing of strawberries, raspberries, currants, etc., has developed into a profitable industry at Sparta and at a number of other places, though on a smaller scale. Raising peas, beans, tomatoes, etc., for canning purposes received considerable attention and the trucking industry in general is being extended in various sections.

Considering Wisconsin's location in regard to markets, the climate, soil, the spirit of progress which prevails everywhere, and considering the fact that throughout this part of the country the farmer is really the man of affairs, the opportunities offered along the line of agriculture in Wisconsin are equalled by few, if any, of the other sections of the country.



MAP 11.—Soil and Agricultural Map of Ohio and Indiana.

Map Legend.

1. Lacustrine Soils, timbered, chiefly of the Dunkirk series. Light gray to brown soils with drab, gray and mottled sub-soils. Some marsh areas also. Chiefly formed from wash from sandstone, shale and limestone. Variable as to texture. Occurs as extensive level to undulating tracts and as terraces along Lake Erie. Devoted to general farming and to fruit raising along lake shore, especially in northeastern Ohio.

2. River Bottoms. Soils of alluvial origin and naturally very productive. A considerable portion is deficient in drainage and some subject to overflow. All general farm crops common to region grown.

3. Light colored timbered soils of glacial origin. Mostly silt loam. Extensive tracts of undulating to gently rolling country. First class general farming region. Corn, grains, grass, dairying and livestock.

4. Light colored timbered soils of loessial origin, chiefly silt loam. Quite badly eroded along streams. Adapted to grain growing, general farming. Some dairying and stock raising. Some fruit also raised.

5. Soils chiefly from sandstone and shales. Light colored, timbered and includes the roughest portions of Ohio. General farming chief type of agriculture.

6. Residual limestone region. Soils naturally strong and productive. General farming.

7. Very similar to No. 5 though less broken.

8. Black prairie soils of glacial origin. Level to gently undulating. Good general farming land. Corn important crop. Some small grains. Dairying.

9. Black Prairie soils of loessial origin, chiefly. Corn land. General farming and some dairying. Considerable areas of deficient drainage.

10. Lacustrine soils, largely prairie. Natural drainage deficient over considerable areas. Some swamp land. Corn, general farming and dairying.

Ohio.

Ohio is one of the more important agricultural states in the Union, and the advance which is now being made in the state along the lines of scientific farming, is certain to place the commonwealth in even a higher position than it occupies at the present time.

From the standpoint of soils, Ohio falls naturally into four more or less distinct provinces. To a certain extent these may be considered agricultural, as well as soil provinces, since the different soils are adapted to different crops. As this adaptation of soils to crops is recognized, agriculture gradually advances to a higher stage of development.

As indicated on the map the greater proportion of the state has been influenced by glacial action and is included in the Glacial and Loessial Province. The greater portion of this region consists of light colored upland soils which were timbered. In the western and north central parts of the state the soils extend to a great depth and are found overlying limestone, chiefly. They are adapted to general farm crops and have a special adaptation for truck, fruit in places and alfalfa. In the northeastern part of the state the soils are light colored and are derived largely by feeble glacial action from sandstones and shales. These soils are adapted to potatoes, grass, oats, and in less elevated positions to corn.

The entire Glacial Province may be considered as forming the richest agricultural division of the state. The topography is undulating to gently rolling, with comparatively few rough regions, and agriculture is highly developed. There are extensive areas of lowlying black land, some of which has been drained and reclaimed and is now producing excellent crops of corn and other farm crops. There are also some prairie regions within this province.

Along the shore of Lake Erie and extending to the southwest from Toledo is a considerable area included within the Glacial Lake and River Terrace Province. This region was at one time all covered by water, the surface is level to undulating or gently

rolling and it included a large amount of fine agricultural land, devoted chiefly to general farming, though immediately along the lake considerable fruit is grown.

The southeastern portion of the state is included in the Appalachian Mountain and Plateau Province and is the roughest and least improved section of Ohio. There are extensive coal deposits in this region and while agriculture is important it has not been as highly developed as elsewhere. The soils of this province are largely residual from sandstone and shale. Many of the slopes are adapted to fruit. There are large tracts of land well suited to grass for hay and pasture and most of the general farm crops do fairly well, where the topography is not too rough.

In the southwestern portion of the state there is a narrow belt of residual soils from limestone, but this tract is quite small as compared with the other sections described. It falls within the Limestone Valleys and Uplands Province. General farming is established in this region, and some special crops including tobacco are also grown.

The raising of certain crops are confined largely to certain portions of the state. Tobacco, for example, is confined chiefly to the southwestern counties. Potatoes, ensilage corn, apples and maple syrup are produced more extensively in the northeastern portion than elsewhere. The dairy industry is developed to a greater extent in the northeastern counties than in other regions. While oats is grown throughout the state there is more raised in northwestern Ohio than in other parts of the state. General farming, stock raising and feeding and breeding are carried on throughout the central, western and northern parts of the state.

Land values throughout the leading farming regions are high. The census returns indicate that during the past two decades the rural population has been decreasing and the average size of farms has been increasing.

As in other well improved sections, the greatest opportuni-

ties in agriculture are to be found along the line of more intensive farming and in specializing. In order to attain the greatest success the most scientific methods should be followed. The state is aiding in the higher development of agriculture in many ways, the most important one of which is in having a soil survey made of the entire state. Reports covering portions of this work are now available and other reports may be obtained free through the U. S. Bureau of Soils as rapidly as the work is completed. A study of these reports will give detailed information concerning the soil and agricultural development in all portions of Ohio.

Indiana.

The state of Indiana is very uniform in the methods and types of agriculture which are followed at the present time. Soil conditions are also about as uniform as can be found in any of the other states, though from the surface geology and from a soil standpoint four divisions may be made, as indicated on the map.

The old glacial lake beds were occupied by water thousands of years ago and the soils found in these places today are very high in organic matter content, especially the heavy types, which are very productive. Areas of peat are also found but many of these are still undrained and undeveloped. The reclamation of these areas will greatly increase the area of agricultural land in the state. The surface of this division is flat to undulating and the natural drainage is defective. Open ditches and tile drains are necessary for the removal of the surplus water. Much of the land is drained and cultivated, though there are tracts of considerable size where the drainage problems have not been worked out. As most of this class of land is near Chicago it is very valuable when once properly drained. There are good opportunities for those who have capital and experience in the development of such tracts.

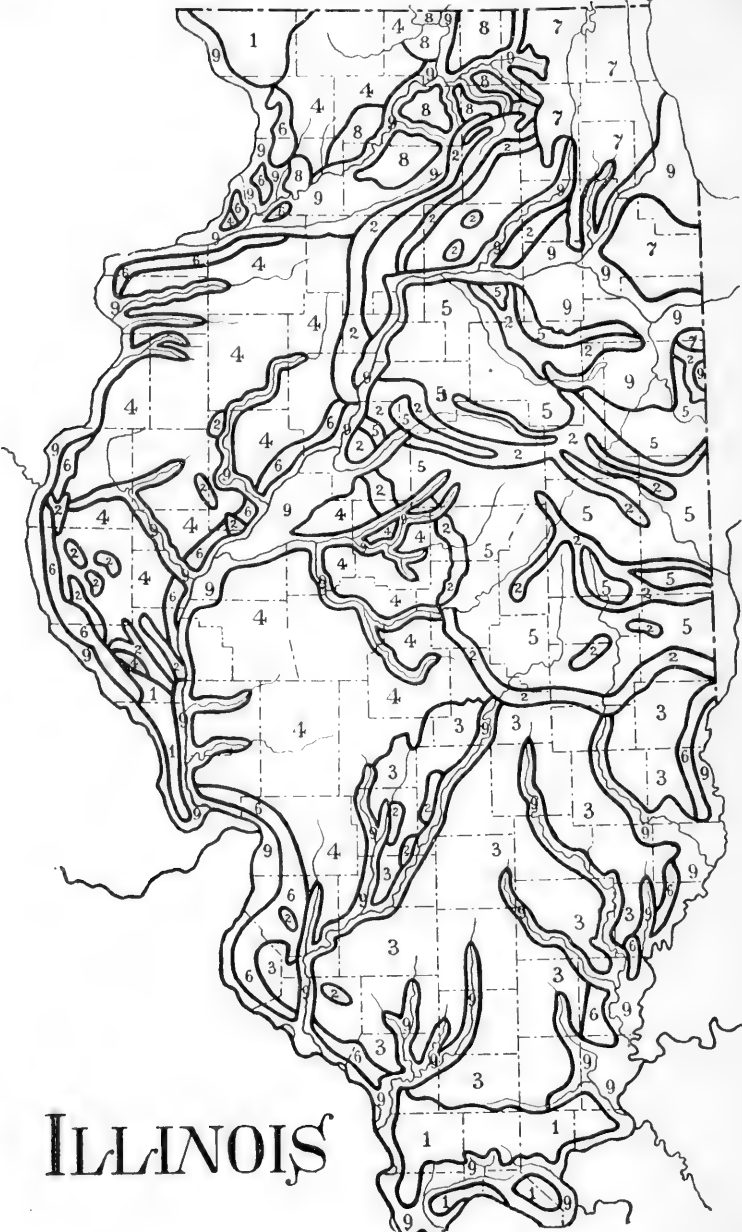
The River Flood Plains form another important division. The bottom lands along the Ohio River and its tributaries within

the state are all naturally very productive and in many places highly developed. While much of the land is protected by levees, drainage is the chief problem and large tracts of rich land are not cultivated because the drainage is defective. Many extensive projects have been installed but there are still thousands of acres to be reclaimed.

The portion of the state indicated on the map as consisting of glacial material is a highly developed agricultural region, where general farming is the leading type of agriculture followed. Dairying and stock raising are important industries and much thoroughbred stock is raised both for the block and for breeding purposes. Land values are high and a large percentage of the land is improved. The surface is level to gently rolling, with a few morainic regions of limited extent. Peat marshes of considerable size are found, especially in the northwestern section. But few of these have been reclaimed, though they offer good opportunities for the agricultural engineer. When properly drained and supplied with potash and phosphoric acid they will be very productive. The soils of the upland region of the division range from sand to clay loam. There are large prairies where the soil is black. There are also large uniform areas of a light colored silt loam. Most of the soils are included in the Miami and Carrington series as mapped by the Bureau of Soils.

A large portion of the southern and western part of the state is indicated on the map as loessial material. The soil of this region is chiefly a silt loam and classed as Marshall silt loam by the Bureau of Soils. Agriculture is quite highly developed over most of the region, though there are opportunities for the introduction of improved methods in some sections and for men who will specialize along particular lines of agricultural production.

As a whole Indiana is highly developed. It is within easy reach of excellent markets and is supplied with first class transportation facilities. As land values are high the opportunities are not as attractive to the young man of limited means as in regions less developed. To make the greatest success on high priced land it is necessary to specialize.



MAP 12.—*Soil and Agricultural Map of Illinois.*

Map Legend.

1. Unglaciated region. Predominating soil a yellow silt loam consisting of loess to depth of about ten feet. The underlying material is largely a residual reddish clay from limestone. Surface rolling to very hilly. Slopes badly eroded. Rather difficult to cultivate. Originally timbered.

2. Morainic areas. Includes material from Wisconsin, Illinoisan and Iowan glaciation. Surface gently rolling to rolling. Includes much good agricultural land.

3. Gray prairie region. Predominating soil consists of a gray silt loam resting upon a heavy, impervious clay, sometimes called "hardpan." Surface level to gently undulating and natural drainage deficient. Organic matter content low. Grain raising, general farming and some stock chief types of agriculture.

4. Brown silt loam prairies. Spoken of as "The ordinary prairie land." Brown to black silt loam soil resting upon yellowish silty clay. Surface gently undulating to rolling, with fair to good surface drainage. Very highly improved. Excellent corn land. Large amounts of stock raised and fed. Some dairying. Land values very high. Contains some small "black prairies."

5. Black Prairie Lands. Sometimes called "gumbo." Soil black, sticky clay loam underlain by drab to yellowish silty clay. Surface flat and drainage deficient. Contains numerous areas of "Brown prairie land," which is more rolling. Good corn land. Stock raising important. Land mostly highly improved. Values high.

6. Loessial hill regions. Soil chiefly deep yellow silt and very fine sand of loessial origin. Forms uplands bordering stream bottoms. Surface hilly with many steep slopes. Erodes to con-

siderable extent. Drainage good. General farming, some stock and little fruit.

7. Wisconsin silt loam region. Mostly from Late Wisconsin glaciation. Chief soil a yellow silt loam underlain by yellowish-brown silty clay loam. Numerous moraines and marshy areas included. Dairying and general farming chief types of agriculture. Trucking also important in certain sections. Land highly improved.

8. Sandy loam region. Soil chiefly a brown sandy loam from Iowan glacial material. Rests upon limestone at from four to ten feet. Low in organic matter. Has excellent drainage but requires careful management to increase and maintain productivity. General farming chief type of agriculture.

9. Bottom lands, swamps and sand areas. Texture of bottom soils variable, though mostly heavy. Large areas subject to overflow. Soil strong and naturally productive. Many large swamp areas can and are being reclaimed with profit.

Illinois.

Illinois is one of the leading states in agricultural wealth. Taken as a whole the land is highly developed and a very large percentage of the state is under actual cultivation. Dairying is a very important industry, especially in the vicinity of Chicago and St. Louis and along the main railroad lines leading into these cities. Stock breeding and feeding are highly developed, especially in the northern and west central portions of the state. Corn is the leading crop and it is grown more extensively throughout these portions of the state than in the southern part. Practically all of the corn finds its way to market in the form of beef and pork. The region is also well adapted to oats and grasses.

The soils of the northern portion of the state consist chiefly of glacial drift with some old glacial lake beds in the vicinity of Chicago. The topography is mostly level to undulating prairies

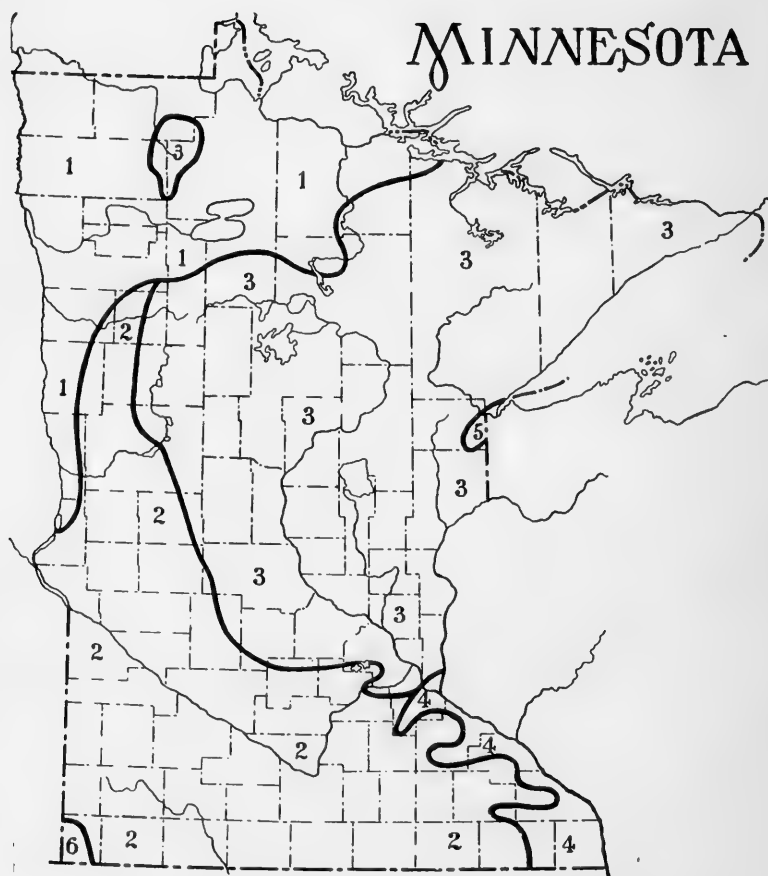
and over large tracts the natural drainage is defective. Both tile drains and open ditches are in extensive use. The soil consists largely of dark brown and black silt loams, which are very fertile and well adapted to corn and grasses. Along the streams are narrow belts of lighter colored soils which originally supported a growth of timber. This class of land is better adapted to grass and grain crops than to corn. In the southern part of the state there are extensive areas of grayish or light brown silt loam of loessial character which is adapted to grass, grain, cow-peas, fruit, etc. Considerable corn is raised but not as extensively as in the northern portion of the state. The topography is more rolling than in the northern part and the natural drainage is better.

Along the Mississippi and Ohio Rivers there are large amounts of bottom land, some of which are highly developed. Much of the land is protected by levees but the natural drainage conditions are poor. The soils are naturally very productive and the great problems that must be solved in the development of such land are drainage questions.

As a general proposition land values have reached such a high point in Illinois that it is difficult for a young man of limited means to buy a farm and come out whole on a general farming proposition. The average size of farms is gradually increasing due to the fact that when a farm is for sale it is bought by a large land owner and added to his already extensive holdings. The man who sells usually seeks for land in some section of country less developed where values are lower. Thousands of Illinois farmers have sold out in the last decade and have moved to the Canadian Northwest. Others have gone to the western part of our own country and some have gone to the rich prairie regions of Alabama and Mississippi where black prairie land can be bought for one-fourth, or less, what land sells for in Illinois.

The man of limited means and experience should not buy high priced land anywhere for farming purposes. Good land can be secured cheaply in many sections of the country where all of the necessities of life can be readily secured and where good schools, churches and places for social gatherings are available. Aside from making a good living in such a section the land will increase in value.

The man of experience and means who wishes to specialize along some particular line of agricultural production will find excellent openings in Illinois. He will be close to the best of markets and in touch with things in general.



MAP 13.—*Soil and Agricultural Map of Minnesota.*

Map Legend.

1. Lacustrine soils of the Red River Valley. Extensive prairie region with black soils consisting largely of silt loam, silty clay and clay of the Fargo series. Soils contain large amount of organic matter and are very calcareous. Devoted chiefly to the raising of grain. Drainage usually deficient and soil inclined to be cold. Grains and grasses do well. Season too short for corn.

2. Undulating to gently rolling glacial prairie soils ranging in color from dark grayish-brown to black. Usually fairly well supplied with lime. Loams and silt loams predominate. Region includes some moraines which are rougher. Small amount of timber originally along streams. Excellent general farming country. Corn, oats, wheat, barley, flax and grasses all do well. Dairying important industry. Most of region well improved.

3. Light colored timbered soils, of glacial origin. Includes large area of pine land, hardwood land and regions of mixed growth. Considerable areas of sandy loam and loam soils. Includes the least developed portions of state. Adapted to grasses, small grains, potatoes, corn and some trucking in southern portion. Dairying is being extended to a considerable extent. Extensive mineral deposits in northern part.

4. Soils of Loessial origin light colored, mostly silt loam. Region badly eroded along streams. Soil fertile and the region is a good agricultural section. Adapted to general farm crops and dairying. Grains do well.

5. Lacustrine soils, originally timbered, having light colored surface and red sub-soil. Mostly clay and clay loam, of Superior series. Good general farming soil, though often the natural drainage is poor. Surface usually nearly level.

6. Dark colored, prairie soils of loessial origin, mostly silt loams. Good general farming region.

Minnesota

The state of Minnesota may be divided into several distinct regions from the standpoint of its soil formation and within these sections there are at least four more or less distinct types of agriculture followed.

The southern and southwestern portions of the state are made up largely of gently rolling prairies. While the black prairie regions are very extensive, there are also areas of light colored soils, but such areas are usually confined to country adjacent to watercourses or morainic belts and this class of land is where all of the timber originally grew. The soils of this region are quite uniform and of the heavier textures, chiefly silt loams and clay loams. They are naturally productive and the country is now well improved and very prosperous. The region when first settled became a vast grain growing section with wheat as the leading crop. This type of farming, however, has gradually given way to a more diversified system until at the present time general farming is now the leading type of agriculture, with dairying on the increase and stock raising as an important branch. The breeding of thoroughbred stock has reached considerable proportions and the feeding of stock for the block is also receiving attention in many localities.

The Red River Valley, in the northwestern part of the state, is another distinct agricultural region and it is also a distinct soil province. It is a grain growing section and wheat is the leading crop, though oats and flax are also important crops. The season is too short to mature corn, though it can be grown for fodder. Grasses do well and a number are taking up dairying and following general farming, though these farmers are in the minority at present. The soil consists largely of alluvial silt. It is black in color and naturally very productive. The surface of the entire region is level to undulating and the natural drainage is deficient. This makes the soil somewhat cold and backward in the spring. Tile drains should be installed to a greater extent than

at present. Farming in this region is on a large scale and may be classed as extensive agriculture, though the tendency at present is to reduce the acreage and cultivate more thoroughly.

East of the Red River Valley and north of St. Paul and Minneapolis and extending to the Canadian line is a vast region, comprising about one-third of the state, but slightly developed. It is the timbered portion of the state and while the original growth included considerable tracts of pine, the major portion of the timber was hardwood. In the extreme northern part of the state there is still considerable timber standing but most of the pine and a large amount of the hardwood has been cut. The cut-over lands are being cleared and farms developed and improvement in that section is quite rapid. The soils as a rule are sandy, but are well adapted to grasses, forage crops and dairying will doubtless be the leading type of farming. Some of the hardy varieties of corn can be matured in the southern part of the region and corn can be grown for silage in all portions of the area. Potatoes do very well also and are an important crop in a number of localities. Land in this region is cheaper than elsewhere in the state and many excellent opportunities are afforded for investment and for the establishing of farm homes.

In the vicinity of St. Paul and Minneapolis and also near Duluth some trucking is carried on and more intensive agriculture is practiced than elsewhere in the state.

The state is well supplied with railroads and markets are excellent. The cities of St. Paul, Minneapolis and Duluth take large amount of farm produce and the mining regions of the north also require a large supply of farm and garden produce for which good prices are always paid.

The rainfall varies from about twenty inches in the Red River Valley to about thirty inches in the eastern and southeastern portions of the state. Dry farming methods are followed to some extent along the western border, but under normal condi-

tions fair crops are obtained under the usual methods of cultivation.

The Agricultural College of the University of Minnesota and the Experiment Station forces are doing a great deal to assist the farmers of the state in dealing with soil and farm management problems, and these institutions are always ready to give out information concerning conditions within the state.



MAP 14.—*Soil and Agricultural Map of Iowa and Missouri.*

Map Legend.

1. Glacial soils of Wisconsin Drift sheet, probably with some loessial material. Good general farming country. Level black prairies, drainage often deficient. Corn, oats, hay, chief crops, dairy and stock raising important.

2. Glacial soils of Iowan Drift sheet, probably with some loessial material. Corn, oats, some wheat, hay. Dairying and general farming leading industries. Fat cattle and hogs raised quite extensively. Chiefly black prairie; better drained than No. 1.

3. Morainic regions. Rougher than surrounding land and originally timbered. Has lower agricultural value than other sections of state.

4. Silt soils, mostly black and of loessial origin chiefly, with some glacial till areas. Extensive prairies. Excellent corn land. Oats and hay also grown. Fruit in places along Missouri River. Large quantities of cattle and hogs raised for the market. Some dairying.

5. Residual soils of Western Prairies. Considerable first class land. Partially prairie. Corn, grains, stock. Some dairying.

6. Limestone region. Including the Ozark Mountains. Rough land and quite stony, though most of soil is strong and productive. Numerous good locations for orchards, especially apples.

7. River bottoms. All alluvial soil, naturally very productive, though portions are subject to overflow. Great variety of general farm, trucking and special crops grown successfully.

8. Light colored loessial soils, mostly silt loam. Badly eroded in places along streams. Good general farming soil and also adapted to fruit.

Iowa.

Iowa is one of the leading agricultural states in the Union and has long been known throughout the world for its large production of corn, hogs and fat cattle. There is a larger

percentage of the land in Iowa improved than is the case in any other state. Land values the state over also average higher than in other agricultural regions of so large an extent. Farm land throughout the major portion of the state, where well improved, ranges in value from \$100 to \$200 per acre, and even higher than this in some instances. Under these conditions it is difficult for a young man of limited means to buy a farm for which he must go in debt heavily, and make a success of the proposition.

On account of these high land values a very large number of people have gone to the Canadian Northwest where land is cheap and the opportunities promising. During the past decade the average size of farms in Iowa has increased and the rural population has decreased, due chiefly to the high land values.

In order that farming on high priced land may be made profitable it is necessary to follow more intensive methods of cultivation than was practiced when values were low. In such regions the farmers who are specializing along some particular line are becoming more numerous, and larger returns per acre are being received. In Iowa the growing of grain on a large scale has gradually given way to a more diversified farming, which would tend to keep up the fertility of the land and also yield a larger income per acre.

Corn is the leading crop of the state and the raising of hogs and cattle, both for the block and for breeding purposes, receives a great deal of attention. Oats is grown quite extensively and wheat is one of the farm crops in some sections, but is grown on a much smaller scale than formerly. Large quantities of hay are grown and some land is devoted to grazing, though the proportion of grazing land on the majority of farms is comparatively small. The feeding of silage during the summer to take the place of a part of the pasturing, is quite common in many regions. The fruit industry has not received a great deal of attention in a commercial way, throughout the state as a whole, but many of the farmers have their home orchards in which

apples, pears, grapes, peaches and plums are raised successfully. Special attention is given fruit raising in several localities and excellent results obtained. Small fruits do very well in many localities and special crops such as potatoes, celery, onions, etc., are successfully grown. Alfalfa is an important crop which is gradually being grown more extensively.

The soils of the state fall into five divisions though as a whole the soils are more uniform than in most of the other states. The north central portion of the state covering an area equal to approximately one-third of Iowa consists of glacial drift. The eastern portion of this drift sheet is considerable older than the western. The eastern is known as the Iowan Drift sheet and the western, the Wisconsin Drift sheet. These regions include much excellent agricultural land, large black prairie tracts and also some soils which were originally timbered. The area is more rolling in the east and has some poorly drained land in the west. The soils range in texture from sandy loams to clay loams but the silt loam is the predominating type.

Within the glacial region and along its outer margin are some moraines which include the roughest areas in the state. They are of comparatively small extent, however.

The largest portion of the state is taken up with soils of a loessial character. The loessial province includes all of the southern part of the state and both the eastern and western margins. The soil is quite uniform in texture, being a silt loam, and there are extensive prairies upon which corn is the leading crop. The soil is naturally very productive, the surface level to gently rolling, except along rivers, where it is quite rolling with high bluffs, and farming throughout the province is on a very firm basis. Land values are very high and are still increasing.

The river bottoms along the Mississippi and the Missouri Rivers form another soil province. The lands within this region are low lying, naturally very productive but poorly drained and all of alluvial origin. When properly drained and protected from overflow they make very valuable farming land. The area

as a whole is comparatively small and is not as highly improved as the other provinces.

The chief opportunities in Iowa are along the line of specializing in the production of certain crops, in the production of beef, pork or dairy products. Dairying is increasing gradually but is not nearly as highly developed as, for example, in Wisconsin. In order to make the greatest success, a small acreage should be cultivated intensively, and the most up-to-date methods followed.

Transportation facilities are excellent in all parts of the state and the best of markets for all of the products of the farm are within easy shipping distance. The rainfall is sufficient for all farm crops and it is normally well distributed throughout the growing season. In the northwestern corner of the state the average precipitation is from twenty-five to thirty inches, while throughout the remainder of the state it is from thirty to forty inches.

The climatic conditions are such that all the usual farm crops mature perfectly. During winter much of the fat stock is protected only by rough sheds to keep out the wind.

Missouri.

Missouri is an important and progressive agricultural state and has a range of farm products equalled by but few other sections of the country. The leading types of agriculture followed consist of general farming, with stock raising as a very important branch, grain growing, fruit raising, with dairying as an industry which is developing quite rapidly. Missouri has a reputation for the fine mules which are raised there, but breeding extends over a much broader field and stock farms devoted to the raising of pure bred stock are numerous. Cattle, horses, sheep and swine are raised in large numbers. The rich agricultural country throughout this and adjoining states provides an excellent market for breeding stock, and St. Louis provides a

good market for horses and mules, as well as for cattle and hogs and all of the products of the farm and garden.

The chief agricultural products are wheat, corn, oats, hay, fruit, garden truck, with some tobacco. Cotton is grown to some extent in the southern part of the state. Most of the corn is marketed in the form of beef and pork and the feeding of stock for market is a very important, extensive and profitable industry.

The state is divided into several more or less distinct soil and agricultural provinces. The Ozark Mountain region, which is the roughest part of Missouri, is confined to the southern portion of the state and from an agricultural standpoint is of importance chiefly as a fruit growing section. The growing of apples receives more attention than other horticultural ventures and the industry has been developed to a considerable extent. The country throughout this region is rough and very rocky for the most part. The soils are derived largely from the weathering of limestone. Much of the country is still undeveloped and land values in such places are still comparatively low. The fruit industry could be profitably extended, though in order to attain the greatest success the most up-to-date and scientific methods must be followed.

In the valleys throughout this province and on the uplands where the surface is not too rough and rocky the soils are adapted to the production of most of the general farm crops grown elsewhere in the state, and these regions are being improved.

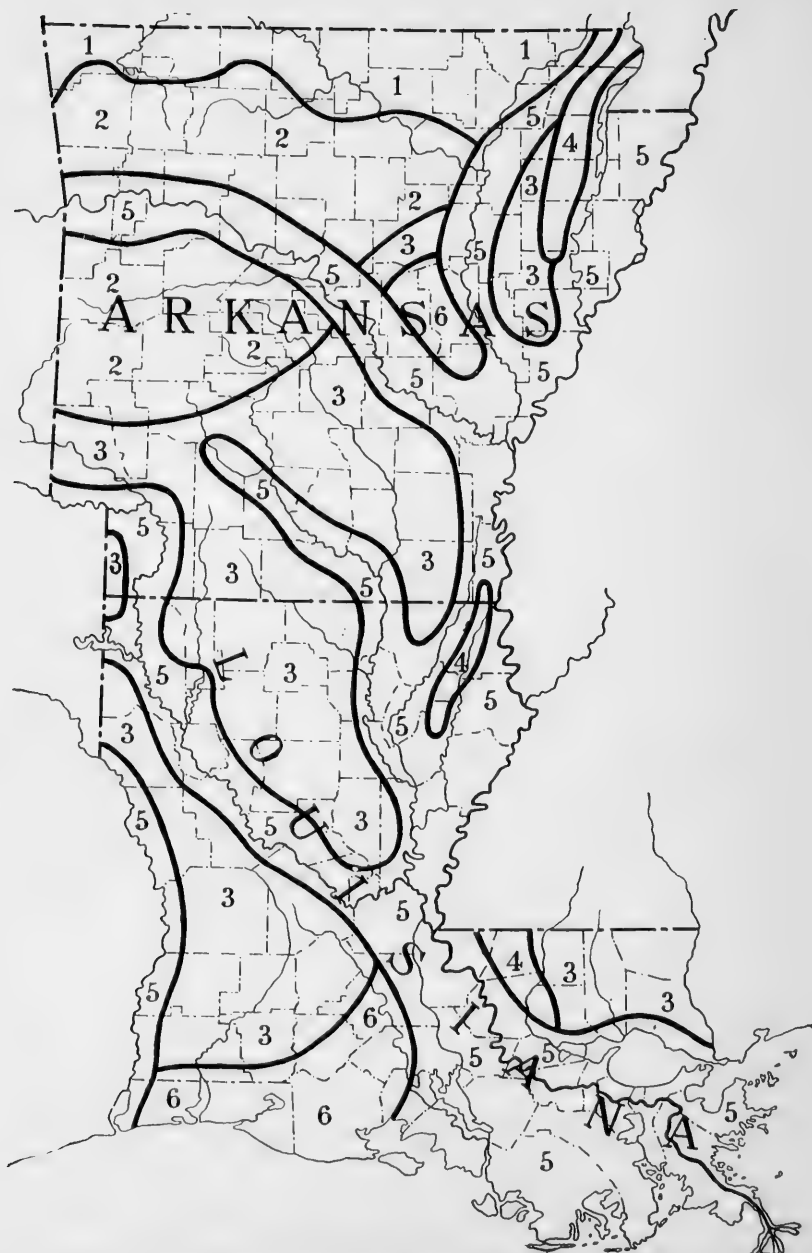
In the west central part of the state, south of the Missouri River, is a region covering portions of several counties where the soils are residual and where the country is included in what is known as the Western Prairie region.

The state is crossed by the Missouri River from northwest to southeast and is bordered on the east by the Mississippi River. Along these rivers there are extensive areas of bottom land where the soil is of alluvial origin and naturally very fertile and productive. In the southeastern part of the state much of this was

originally in a swampy condition and all of the bottom lands are naturally deficient in drainage. Large tracts, however, have been reclaimed by the construction of large drainage ditches and the land is being improved rapidly. Levees protect the low lands from overflow in most cases, but drains are necessary to remove the excess rainfall and to lower the water table. Where improved, these bottom lands are producing excellent returns and paying big dividends upon the money invested in the original purchase price and in the drainage of the land. Many good opportunities are presented for investment in these lands, as the values are still low.

The northern portion of the state is covered with a mantle of loess and this extends to a short distance south of the Missouri River. Much of this region consists of black prairie and it includes the richest and best developed farming sections of the state. Grain growing has long been important in this region but the acreage is being reduced and more attention is being given to the raising of livestock. Corn is a very important crop and cattle and hogs are the chief products sold from many of the farms. The large holdings of former years are being cut up into smaller farms. Dairying is on the increase.

The Mississippi and Missouri Rivers furnish water transportation, which is a factor not to be overlooked, and the state is well supplied with railroads, so that shipping facilities are in most cases adequate for the needs of well developed agricultural regions. The average rainfall of the state is about thirty-nine inches and this is fairly well distributed, so that periods of drought are rare. The state as a whole presents attractive opportunities for those wishing to engage in farming. The climate is mild and healthful, land is reasonable in price, and markets are good.



MAP 15.—Soil and Agricultural Map of Arkansas and Louisiana.

Map Legend.

1. Residual limestone region, including the Ozark Mountains. Rough country but slightly improved. Many good locations for orchards. Soil productive but usually very stony and surface uneven.

2. Appalachian Mountains and Plateau region. Rolling to mountainous. Soils mostly sandy. Much unimproved land.

3. Coastal Plain region, including black prairies, rice lands, sandy soils with red subsoil and some loessial soils. Developing into fine agricultural section. Cotton, corn, rice and many other general farming and truck crops.

4. Loessial soils, mostly silt loams. Of limited extent. Good trucking and general farm land, though erodes rapidly on unprotected slopes. Soil responds quickly to careful treatment.

5. River Bottom Lands. All alluvial soil, naturally very productive. Subject to overflow in places. Requires drainage over large areas. Well adapted to cotton, corn and variety of general farm crops, including alfalfa. Suitable also for trucking. Considerable timber still standings.

6. Dark colored soils, partly prairie. Mostly silt loams. Surface generally level to undulating and drainage frequently deficient. Mostly good agricultural land and some of it is highly developed. Rice is an important crop. On lighter soils trucking is carried on.

Arkansas.

From a soil and geological point of view the state of Arkansas may be divided into five provinces, all of which are developed over a considerable area.

The River Flood Plains Province includes the extensive bottom lands along the Mississippi, Arkansas and Red Rivers and also along numerous smaller streams which traverse various portions of the state. The soil in the bottoms is all alluvial and naturally

very productive. The land is somewhat sandy along the border of the streams but becomes heavier as the distance from the river channel increases, until in the low interstream areas it is a heavy clay. This low land back from the streams is poorly drained and before the greatest success can be attained it is necessary to install drainage systems. The sandy land along the stream is better drained than the land further back and good crops can be secured on these low ridges nearly every year without drainage. Over a large part of the bottoms cotton and corn are raised without ditching but the fields are irregular and in the spring and whenever there are heavy rains there is danger from too much moisture. The bottoms are protected from the rivers by levees which usually withstand all floods, but in times of extremely high water a break sometimes occurs in the levee and much damage results from the flooding of the low lands. Land in this Province in Arkansas is very cheap and adapted to a wide range of crops. The greatest objection is the danger from flooding.

The Atlantic Coastal Plain Province includes most of the southern and southeastern portions of the state outside of the bottoms. The soils range from sands and sandy loams to heavy black prairie. On the prairies of southern Arkansas the rice industry has been developed to a considerable extent and is still growing in importance. Cotton is the leading crop over the region as a whole and some corn is also grown. The soils are adapted to a much broader range of crops than are being grown at present. There is still considerable timber standing and land values are comparatively low especially where no improvements have been made.

The Loessial Province includes deposits of silt of loessial origin, found along the eastern margin of the state bordering the bottoms. The soil is a silt loam which can be readily worked and made to produce very satisfactory crops under careful management. It offers especially good opportunities for improvement. It is easily eroded where the surface is uneven but

where undulating or level there is no danger from this source. Land of this character can be bought at a very reasonable figure.

The Ozark Mountain region in the northern part of the state is included in the Limestone valleys and Uplands Province. The soils are derived largely from the weathering of limestone. The surface is for the most part rough and the soil is frequently very rocky. The fruit industry, especially the growing of apples, has been developed to a considerable extent in this region. General farming is also carried on to some extent, but most of the land is still unimproved. Some of it is too rough to be of any value for agricultural purposes, but there are tracts where all of the crops common to the region can be successfully grown and also where orchards can be planted. Values are still very low.

Immediately to the south of the Limestone region is found a region belonging to the Appalachian Mountains and Plateaus Province. This covers a considerable area on both sides of the Arkansas River. The northern part of this region is similar in topography to the Limestone region but it becomes less broken towards the south. There are extensive tracts suitable for apple culture in this region and where the surface is not too rough all of the crops common to the region can be successfully grown. Continuous growing of cotton is being replaced by diversified farming, agricultural practices are being improved and better livestock is being raised.

The state as a whole presents many excellent opportunities for investment in land and for the actual improvement of farming lands.

Louisiana.

The most important agricultural region of Louisiana is included within the river bottoms which are very extensively developed along the Mississippi and Red Rivers. The extensive sugar plantations of which nearly every one has heard are located on these bottom soils. The low lands are protected from the rivers by levees, though there are very extensive areas where

the land is so low and level that the natural drainage is very poor. Throughout the "bottoms" the highest land is immediately along the river and the surface gradually becomes lower as the large interstream areas are reached. The texture of the soil also changes and while the land along the river front is usually a fine sandy loam, the material gradually changes until in the low swampy areas it is a heavy clay or clay loam. All of this soil material is alluvial and naturally very productive.

At the present time a number of large drainage projects are being developed in the Louisiana Bottoms and thousands of acres of this low land are being reclaimed. Where good drainage is once established magnificent crops—corn, cotton, alfalfa, and sugar-cane are being raised. In fact certain portions of the "bottoms" are exceeding equal areas of Illinois in the production of corn. With the drainage of the low lands, the healthfulness of the region also increases, and what has often been thought of as a malaria infested region fit only for colored people to inhabit, is now developing into a rich agricultural region with the number of substantial homes and enterprising white settlers greatly on the increase.

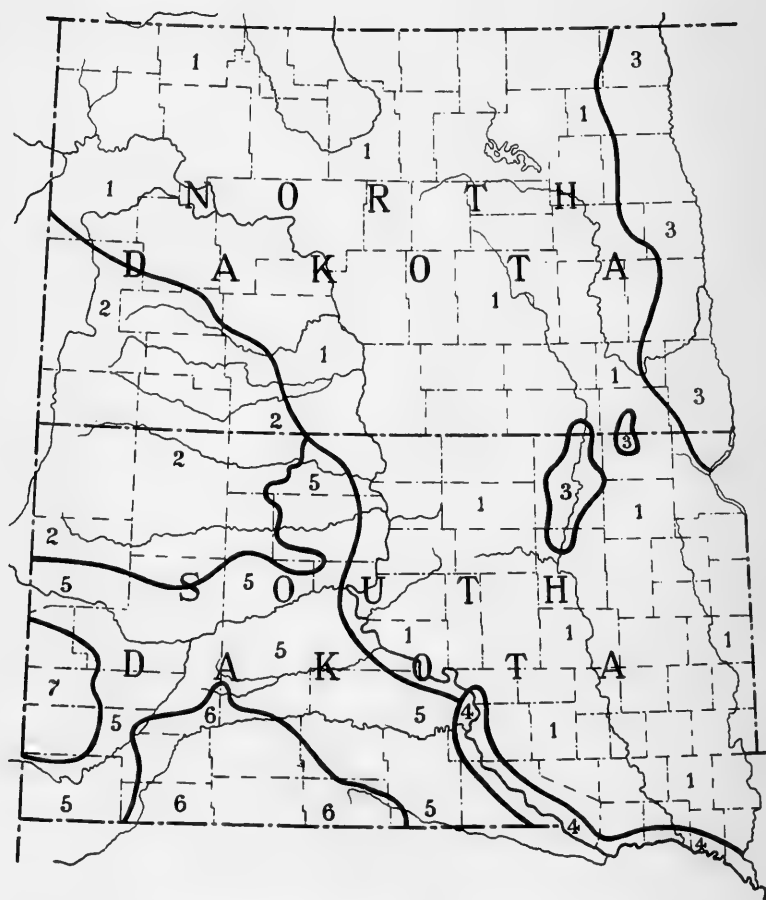
Over large areas of the "bottoms" there are still valuable tracts of timber, but this is being rapidly cut off and the land made available for agricultural development. Large tracts of land can be bought very cheaply but it should always be borne in mind that before the greatest success can be attained in growing crops, it will be necessary to thoroughly drain the land, which is quite an expensive undertaking. When thorough drainage is once established the land is of almost inexhaustible fertility. General farming, stock raising, dairying and the raising of cotton and sugar-cane are the lines of farming best adapted to this region. Alfalfa can be successfully grown here also.

In the vicinity of Crowley and extending into other portions of the state the rice growing industry has been developed to a considerable extent. For this crop the land must be level and there must be an abundance of water for irrigation. As soon as

the rice is sown and is up about four inches the land is flooded and the water is kept on the fields until the grain is nearly mature. It is then drawn off so the land will dry out sufficiently to use modern machinery in harvesting the rice. This industry has proven to be a profitable one and the acreage is gradually increasing. There are large tracts of land suitable for growing rice and as the consumption of this grain is increasing yearly, the opportunities for rice growing are promising.

The soils of the upland portion of the state belong chiefly to the Norfolk and Orangeburg series with some types of the Susquehanna and a number of other minor series represented. The greater proportion of the upland country is but slightly developed, there being considerable areas still in timber, which consists chiefly of pine. This land is capable of being profitably developed but in many regions transportation facilities are not adequate for the marketing of farm products.

Louisiana offers many good opportunities along the line of agricultural development. In purchasing land in this state especial attention should be given to the title to property, since in some places titles are apt to be defective.



MAP 16.—Soil and Agricultural Map of North and South Dakota.

Map Legend.

1. Black Prairies within the glacial region. Surface level to undulating and gently rolling. Getting into semi-arid country to the west. Grain growing and stock raising chief lines of farming. Some dry farming in the west.

2. Prairie soils of unglaciated region. Dark grayish-brown soil with light gray to yellow calcareous sub-soils. Surface is a gently rolling plain in which streams have cut channels. Some broken land adjoining streams. Semi-arid region. Grazing chief type of agriculture.

3. Red River Valley. Black prairie soils with high organic matter content. Level to gently undulating, drainage often deficient. Grain raising chief industry with general farming and dairying on the increase in the south.

4. Bottom Lands. Soils of alluvial origin.

5. Brown prairie soils in residual region, mostly clay, clay loam and silt loam types. The clay is commonly called "gumbo." Undulating to gently rolling country. Soils productive, but rainfall limited in most of region. General farming on the increase. Some dry farming. Grazing still quite important.

6. Soils of Plains Group. Dark gray to brown surface soils, with light colored, almost white, very calcareous sub-soils. Easily eroded and white sub-soil exposed in many places, which are known as the "Bad Lands." Mostly silt loam. Semi-arid region. Agriculture not highly developed.

7. Region of timbered, unglaciated soils, semi-arid. Surface quite rough and of little present agricultural value.

North Dakota.

North Dakota may be divided into four more or less distinct agricultural provinces. The extreme eastern portion of the state lies within the valley of the Red River and comprises a very important grain growing section. The soil is of alluvial origin,

very dark colored, rich in organic matter and naturally very productive. The surface is level to undulating and the natural drainage is somewhat deficient. Land in this region is mostly held in large tracts though the tendency is to break up these large holdings into smaller farms and grow a greater variety of crops. It is probable that in time dairying may become an important industry in this region although the growing season is too short for corn to mature. Grasses do well and a system of general farming in connection with grain growing would seem to offer good opportunities.

There is a small section in the southeastern corner of the state where dairying has been developed to a considerable extent. The industry is gradually being extended and is proving to be profitable.

The greater proportion of the state is given over to a system of farming in which grain growing and stock raising are combined. While the soil is naturally productive, as a rule, the rainfall is frequently deficient and this is usually the limiting factor in crop production. Within the past decade thousands of settlers have taken up homesteads throughout this region and established homes. There are still considerable tracts open to entry, though the most desirable lands have been taken. Land values are gradually increasing as the country develops and there are many good chances for investment and for engaging in general farming operations. The large grain farms and ranches are slowly disappearing before the advance of the settler and homesteader and it will not be long until all of the larger tracts are cut up into farms. All of the crops common to the corn belt, with the exception of corn, can be successfully grown.

In the western and southwestern portions of the state ranching still predominates and as the rainfall is less further east this region will continue to be a ranching country until the other portions of the state are pretty well taken up. In the southwestern corner of the state the surface is very rough and broken

and is best suited to grazing. The water supply for stock usually controls the situation and where the water is owned by one man he can readily control all grazing land tributary to such drinking places. In such places where the possibilities for the growing of cultivated crops are slight, the ranchman is comparatively secure and as other portions of the state are being subdivided, the sections suited only to grazing increase considerably in value. With the reduction in the number of large ranches the price of beef advances and good cattle or sheep ranches are therefore better paying propositions than ever before.

South Dakota.

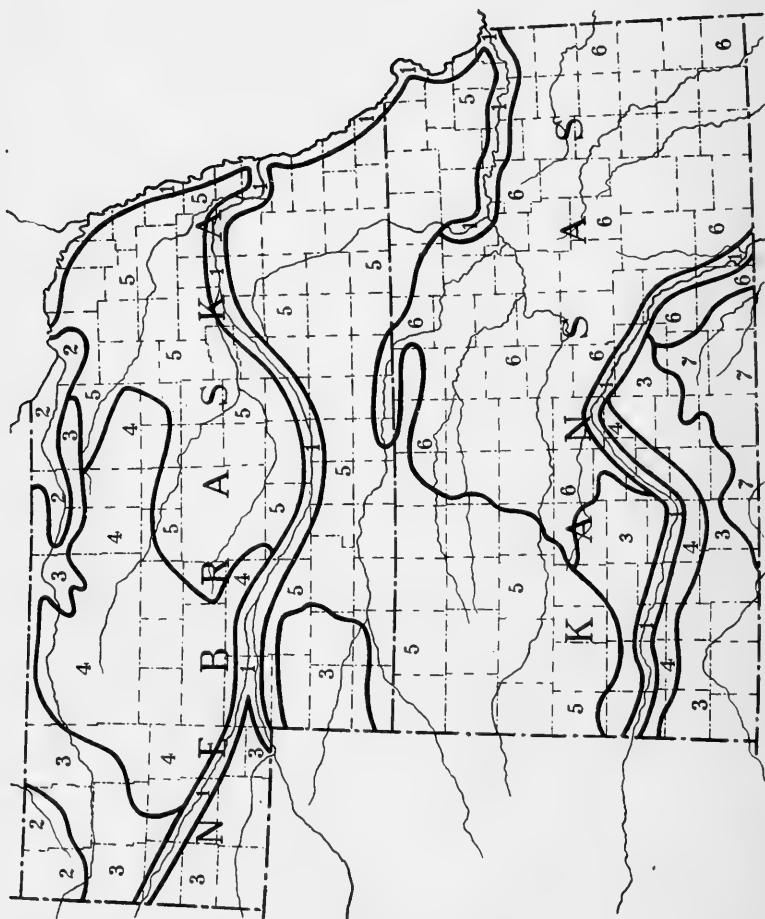
The state of South Dakota is divided into two agricultural districts which are separated roughly by the Missouri River. Throughout the eastern section diversified farming is practiced almost exclusively. All of the crops common to the corn belt are grown successfully. The southern portion of the east section produces considerable more corn, and with considerable less danger, than the northern portion. This portion of the state has developed very rapidly during the last fifteen years and the population is still increasing. Dairying is gradually being extended, though a large amount of grain is being grown and grain raising receives more attention than any other one line of farming. The tendency at the present time, however, is to reduce the acreage of grain and pay more attention to live stock and dairying.

The western portion of South Dakota while considered only as a grazing country a short time ago is now rapidly settling up in many districts as government land has been thrown open to entry. The soil over much of the region is strong and productive but the rainfall is not as great as further east in the state. Dry farming methods are employed with success in this region and such methods are necessary if the greatest success is to be attained. There is still considerable ranching in this portion of

the state but the large tracts are being cut up into smaller holdings. In the Bad Lands the country is very rough, the rainfall is limited and thus this section is not at all suited to the growing of cultivated crops. It is probable that the Bad Lands will never be utilized for any other agricultural purpose than grazing. In the western part of the state there is still considerable government land which can be homesteaded and those wishing to secure a home in this way should ask the United States Land Office for information as to available lands in South Dakota.

Wherever water for irrigation can be obtained and the surface is nearly level, irrigation may be successfully carried on. The government has carried on considerable irrigation work in the western part of the state and private concerns have also brought considerable land to a high state of productiveness by means of irrigation. In numerous instances individual farmers can install an irrigation system of their own.





MAP 17.—Soil and Agricultural Map of Kansas and Nebraska.

Map Legend.

1. River bottoms. Mostly dark-colored soils, all of alluvial origin and naturally productive. Subject to overflow in many places, though large proportion used for farming purposes.

2. Dark brown prairie soils, mostly clay or clay loam derived from slate-colored clayey shale. Soil very sticky and called "gumbo." Semi-arid, though some farming operations carried on in eastern portion.

3. Dark-colored prairie soils occupying extensive plains where grazing has long been chief industry. Mostly semi-arid. Some dry farming and irrigation along streams. Soil productive when supplied with moisture.

4. Region of sand dunes and sand hills. This section has little present agricultural value. Sand loose and incoherent and of considerable depth.

5. Dark colored prairie soils chiefly of loessial origin. Mostly silt loam. Includes best agricultural region of Nebraska and northeast Kansas. Excellent farming country. Corn, wheat, oats, barley, alfalfa, dairying, livestock, fruit and truck crops in some localities. Semi-arid in west, mostly devoted to grazing, though some dry farming is being practiced.

6. Light gray to black prairie soils from carboniferous and cretaceous shales. Mostly silt loams and silty clay loams, with very compact, heavy sub-soils. Includes best farming country in Kansas. Corn, wheat, oats, alfalfa, barley, some truck crops dairying and livestock. Semi-arid in west where considerable grazing still carried on and some dry farming practiced.

7. Soils chiefly derived from red sandstones and shales, and have a decided red color. Fairly good soils, though often subject to erosion. Some general farming, though bordering semi-arid country.

Kansas.

The state of Kansas occupies a position partly within the humid and partly within the semi-arid portions of the United States. The rainfall in the extreme southeastern corner of the state is about forty inches while in the extreme western part it is but fifteen inches annually. All intermediate conditions are found within the state and the variations of the rainfall are the chief factor in determining the type of agriculture which can be most successfully followed.

The elevation along the Missouri River in the northeastern corner of the state is about 750 feet above sea level. The surface gradually rises as the distance west increases until along the western border the elevation is about 4,000 feet above sea level. The variations in elevation together with the variations in rainfall produce marked differences in the climatic conditions throughout the state.

The agriculture regions of Kansas fall into three provinces, two of which are extensively developed and the third is only found to a limited extent.

Most of the eastern half of the state with the exception of the northeast corner, lies within the Residual Soils province of the Western Prairie. This region includes vast areas of excellent farming land, a considerable amount of which is well improved and yielding very profitable returns.

The western portion of the state and the northeastern corner are included within the Glacial and Loessial Soil province. This portion of the province includes considerable material of loessial character. The eastern extension of this province in the state includes excellent farming sections where agriculture is highly improved and where the farmers are so prosperous as to give Kansas a national reputation. Further west as the rainfall becomes less, conditions become less favorable for cultivated crops and more grazing is carried on. In the southwestern part of the state is a considerable area of very sandy land where the vegetation is

very scanty and where the possibilities for improvement are remote.

Another province consists of the River Flood Plains. Extensive areas of bottom land are found along the Missouri, Arkansas and Kansas Rivers. This soil is naturally very productive. In the valleys of the Arkansas and Kansas Rivers much of the soil is sandy but under irrigation in the west produces excellent returns.

Corn and wheat are the two leading crops in the state, though oats, rye and barley are also largely raised. Alfalfa is also a very important crop and one which is being grown more extensively each year. While there are still a considerable number of large wheat farms, these are gradually being cut up into smaller tracts and more diversified farming is coming to take the place of this extensive type of agriculture. The raising and feeding of livestock is very important and the dairy industry is growing rapidly. The raising of poultry has become an important industry. The raising of fruit, vegetables, sweet and Irish potatoes, etc., is of considerable importance in some sections.

Most of the general farming operations are confined to the eastern part of the state east of one hundredth meridian. The western portion of the state is still largely a grazing country. Dry farming is carried on in places where the rainfall is not sufficient and profitable crops are secured when the dry farming methods are carefully followed. The western section is very thinly settled and there is still considerable public land open to homestead entry, though the best has been taken. There are many opportunities to extend farming under dry farming methods in west Kansas. In the eastern portion the best opportunities are in the more intensive improvement of small farms.

Nebraska.

The state of Nebraska falls within several soil provinces, though the types of agriculture followed in the state can not be sepa-

rated by the same lines. The state is bordered on the east by the Missouri River and traversed from west to east by the Platte River. Along both of these streams are found areas of bottom land where the soils are of alluvial origin and very rich and productive.

The eastern portion of the state in the uplands is within the Loessial Soil province while the western part of the state is within the Rocky Mountain Valleys and Plains region.

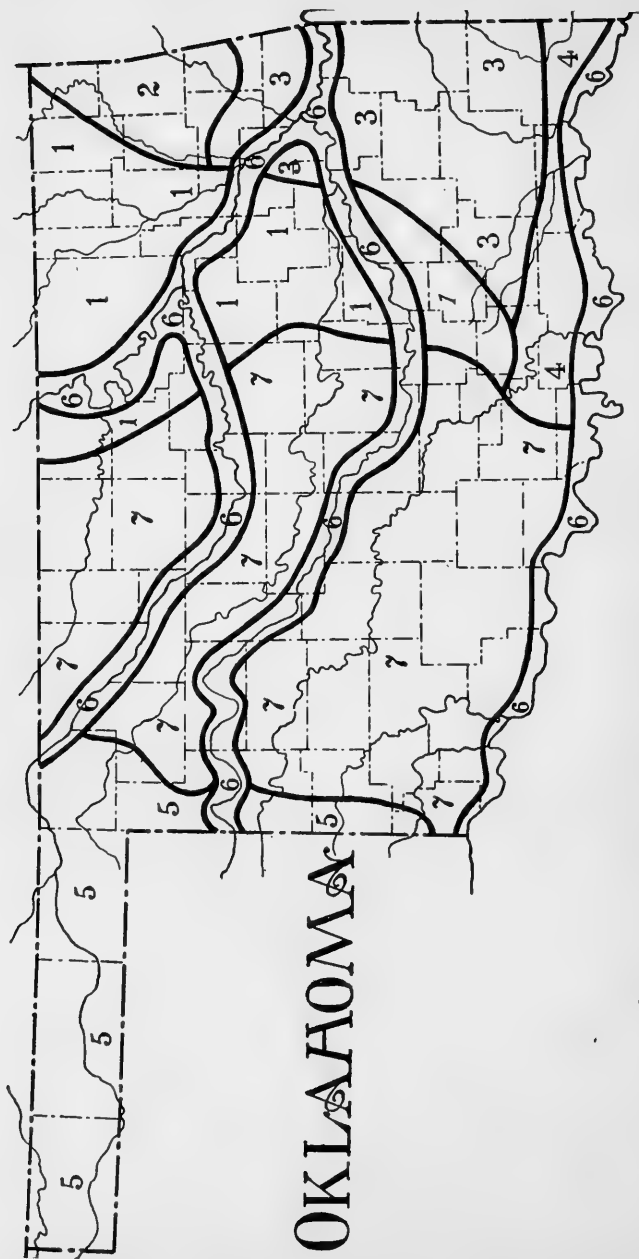
The elevation at the Missouri River is about 1,000 feet above sea level, while on the western border of the state it is about 5,000 feet. The surface in the eastern part consists chiefly of undulating to gently rolling prairie. Going westward some rough, broken areas are found and as the west and northwestern parts are approached the surface consists of rough, rugged buttes. In the north central part of the state there is a considerable tract of rough sand hill country where the soil is very unproductive and of little value. The rainfall varies from about thirty-one inches along the east border to about fifteen inches along the western boundary of the state. The amount of rainfall determines, in a large measure, the type of farming which may be followed.

In the eastern portion of the state general farming, the raising of livestock and the raising of small grains are the chief types of farming practiced. Grain growing was formerly very extensively engaged in and there is still a large amount of wheat raised. General farming, however, has largely taken the place of wheat raising and dairying is coming to be a more important industry. The crops grown consist of corn, wheat, oats and hay with fruit, sugar beets and a few other crops grown on a smaller scale. Alfalfa is grown quite extensively and is one of the important hay crops. Wheat is grown most extensively in the central and southwestern parts of Nebraska.

Large numbers of cattle are fed and fitted for market in eastern Nebraska and the eastern part of the state is sometimes

spoken of as the feed lot for the western range section of the state. Hogs are raised to considerable extent and much of the corn finds its way to market in the form of pork and beef.

The western part of the state is semi-arid and still contains many large cattle ranches. A considerable portion of it is better suited to grazing than to the production of cultivated crops. A considerable amount of land in the west and southwest, however, is under cultivation and more is being taken up each year. Dry farming methods are practiced and by this means alone can profitable crops be secured unless the land is irrigated. In general, land values decrease with the distance west from the Missouri River. There is still considerable land open to homestead entry in the western part of the state, but the best has been taken.



MAP 18.—Soil and Agricultural Map of Oklahoma.

Map Legend.

1. Chiefly black prairie soils with some timbered areas. Residual soils. Mostly well improved and adapted to great variety of crops, including corn, oats, wheat, tobacco and some cotton. Dairying, general farming and stock raising.

2. Limestone soils including outer margin of Ozark Mountain region. Rather rough country but soils are naturally quite productive. General farming and some fruit.

3. Light-colored timbered region with soils mostly from sandstone and shales. Surface rather rough and not as well improved as central portion of state.

4. Coastal Plain region, including some black prairie soils, though most of region has light-colored timbered soils. Sandy loams predominate. Cotton, corn, general farming chief types of agriculture.

5. Mostly black prairie soils and semi-arid. Ranching still important over part of region. Some dry farming.

6. River bottoms Alluvial soil, naturally very productive.

7. Chiefly red prairie soils with considerable areas of lighter colored timbered soils, especially toward the east and becoming semi-arid in the west. Good agricultural region with great range in crop production. Wheat, cotton, corn, oats, fruits, grazing, dairying and general farming. Some dry farming in the west.

Oklahoma.

Oklahoma is situated midway between the north and the south and on the dividing line between the humid and semi-arid regions. Because of its peculiar location and varied conditions, the agriculture is more varied than in most of the other states. Oklahoma has been developed in a short period of time by farmers from all sections of the country, so that the population as well as the agriculture consists of a number of types. Originally

the entire state, which includes what was formerly Indian Territory, consisted largely of extensive cattle ranches, but this industry has given way to the homesteader and small farmers until at present only a comparatively small portion of western Oklahoma may still be classed as a ranching country. .

Corn, wheat and cotton, a most unusual combination, constitute the chief crops grown for the market. In general, wheat is grown most extensively in the north central part, corn in the eastern two-thirds, though both crops are raised in various amounts in every country in the state. Cotton is most largely grown in the southern part of the state, though some is raised in every county except one or two. The extreme southeastern part of the state is largely undeveloped agriculturally and consists of a rough, somewhat mountainous region in which there are valuable deposits of coal, and probably other minerals.

Commercial orchards are confined largely to the eastern one-third of the state but nearly every farmer has his home orchard and garden. Kafir corn is an important substitute for Indian corn in the western part of the state where the rainfall is the least.

Rainfall and temperature determine the principal crops. From an average of about forty inches along the eastern border of the state, the precipitation decreases gradually to about twenty inches along the northwest border and to less than that amount in western Beaver County, which occupies the extreme end of the arm extending along the north border of the Texas Panhandle. The rainfall being well distributed makes it possible to grow better crops than the amount of precipitation would indicate. On the average, two-thirds of the rainfall occurs in the months from April to September, the time from October to March being comparatively dry.

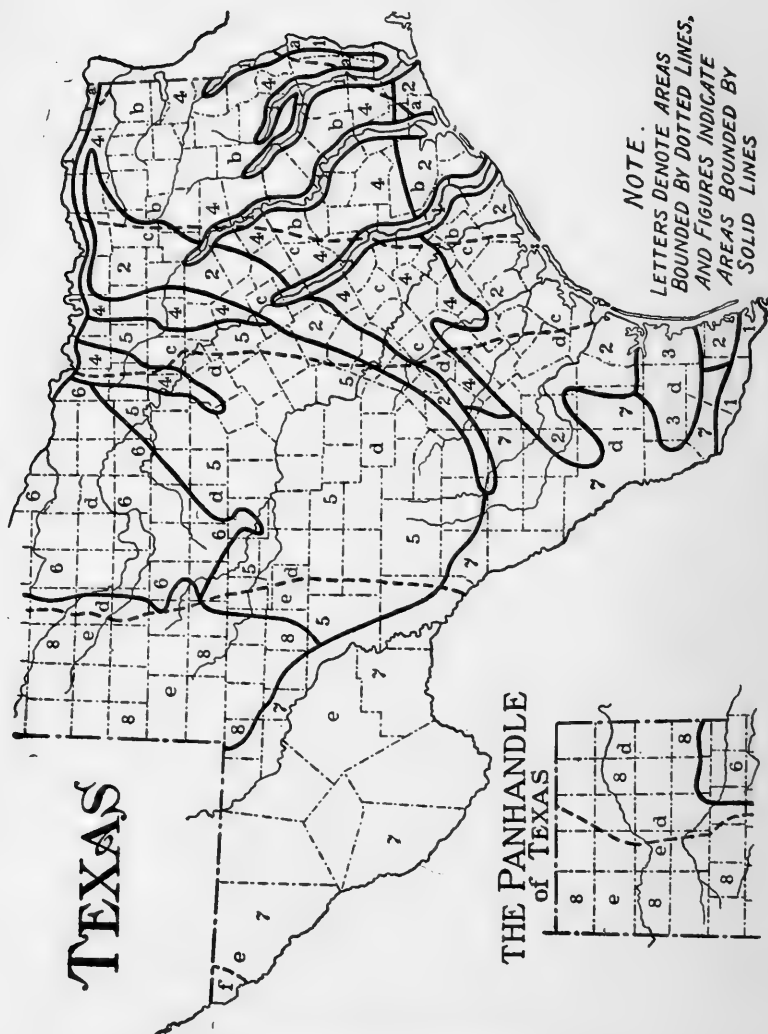
The dairy industry is developing quite rapidly, but the raising of cattle in general is somewhat retarded by Texas fever, though this is now fairly well under control in all portions of the state. Where the cattle were formerly raised on large ranges

they are now kept on all of the small farms and the total number is far greater than in the days of the extensive ranches. Hogs are raised quite extensively in the eastern and central portions of the state. One of the most valuable crops produced in Oklahoma, and one which is growing in favor rapidly, is alfalfa. It is cut for hay and is also pastured to a considerable extent.

As indicated on the map, soil provinces are represented in Oklahoma and the soils as well as the climate, precipitation and agriculture are varied. Where the rainfall is deficient, dry farming methods are being followed to some extent and in a few places irrigation projects have been developed.

The opportunities presented in Oklahoma along the line of agriculture are numerous. The greatest field doubtless lies in developing more intensive farming. Land values have risen very rapidly, but in many sections good farming land can still be bought at very reasonable prices.

Next to agriculture, the mineral resources of the state are most important. Coal, oil and natural gas are found in abundance and their rapid development has attracted wide attention and greatly increased the wealth of the state.



MAP 19.—*Soil and Agricultural Map of Texas.*

Map Legend.

1. River bottoms. Soils of alluvial origin. Naturally productive. Subject to overflow in places. Considerable areas still unimproved.

2. Black Prairie regions within Coastal Plain. Soils mostly clay loams and very calcareous. Surface level to undulating and gently rolling. Excellent farm land. Cotton, corn, alfalfa, small grains and general farming. Trucking along the coast. Some fruit.

3. Region of sand dunes and sand hills. Of little agricultural value.

4. Light-colored timbered soils of Coastal Plain region. Light-colored surface soil with yellow or red sub-soils. Sandy loam types predominate. Long and short leaf pine chief growth. Cotton, corn, chief crops. Some small grain, sorghum, cane, fruit and truck crops.

5. Dark-colored residual prairie soils from limestone. Red sub-soils quite common. Silty clay loam and clay are chief types. Rock often outcrops and surface stony in many places. Rainfall limited—semi-arid region. Grazing still chief line, though general farming and some dry farming developed, chiefly in eastern portion. Some irrigation of small tracts.

6. Mostly red prairie soils from sandstone and shales. Some timber in northeastern portion, becomes semi-arid toward the west. Grazing, grain, with some dry farming and general farming chief lines followed. Land held chiefly in large tracts.

7. Arid and semi-arid country. Grazing chief industry, though supply of grass limited. Some irrigation along Rio Grande River, especially in vicinity of Laredo.

8. Dark-colored prairie soils in semi-arid region. Grazing still most important, though considerable grain and some general farming in the Panhandle region. Some irrigation and dry farming.

Rainfall:

a—50 to 60 inches annually.

b—40 to 50 inches annually.

c—30 to 40 inches annually.

d—20 to 30 inches annually.

e—10 to 20 inches annually.

f— 0 to 10 inches annually.

Texas.

The state of Texas covers such an extensive scope of country and embraces such a diversity of conditions that only brief mention can be made here of some of the most widely recognized agricultural divisions. The wide variation in the rainfall is responsible, to a large extent, for the great range of agricultural practices followed. The rainfall varies from over fifty inches along the eastern portion of the gulf coast to eight inches at El Paso. Roughly speaking, the east half of the state is humid, while the west half is arid and semi-arid. A line drawn north and south across the state, one hundred miles west of Fort Worth, and through a point midway between Corpus Christi and Laredo, may be said to separate the two regions.

What is commonly spoken of as the coast country embraces the region extending from the Louisiana line to the Rio Grande River and back from the Gulf of Mexico for from fifty to one hundred miles. It includes soils ranging in texture from light sands to heavy clay loams. There are extensive prairies of rich black soil and smaller areas of sand and sandy loams. The Coast Country is rapidly developing and it is now the largest and most productive trucking region in the country. Much of the land is being sold in small farms to people from all parts of the Union, and this section of the state is being more rapidly settled than any other portion. In the valley of the Rio Grande, near Brownsville, a large amount of sugar-cane is being raised and some of the largest irrigation ditches in the country are to be seen here. Bermuda onions are extensively grown in some sec-

tions, though the center of this industry is at Laredo, further up the river. They are grown under irrigation, chiefly. In the vicinity of Corpus Christi the rainfall is not always well distributed throughout the growing season and considerable irrigation is carried on. The water comes largely from artesian wells. Some dry farming methods are also followed at times. All of this region was at one time a ranch country and some stock raising and grazing are still carried on, though not nearly as extensively as in earlier days. Some general farming is also practiced.

The eastern and northeastern parts of the state in the timber belt are very similar to the northern part of Louisiana and the southern part of Arkansas. The soils are largely of a sandy nature at the surface with sandy clay forming the sub-soil below eighteen to twenty inches. The original timber in this section was largely pine. Throughout a portion of this region the fruit industry has been developed. Peaches, in particular, are grown extensively. The industry has not been as successful as in some other states and one reason for this is that many of the orchards are larger than the owners can properly handle and the fruit has not been properly graded and packed for shipment. Much of the crop has often gone to canning factories when good prices could have been obtained had the fruit been placed on the northern markets in good condition. While fruit is grown quite extensively, general farming predominates and cotton is the most extensively grown crop, with corn second.

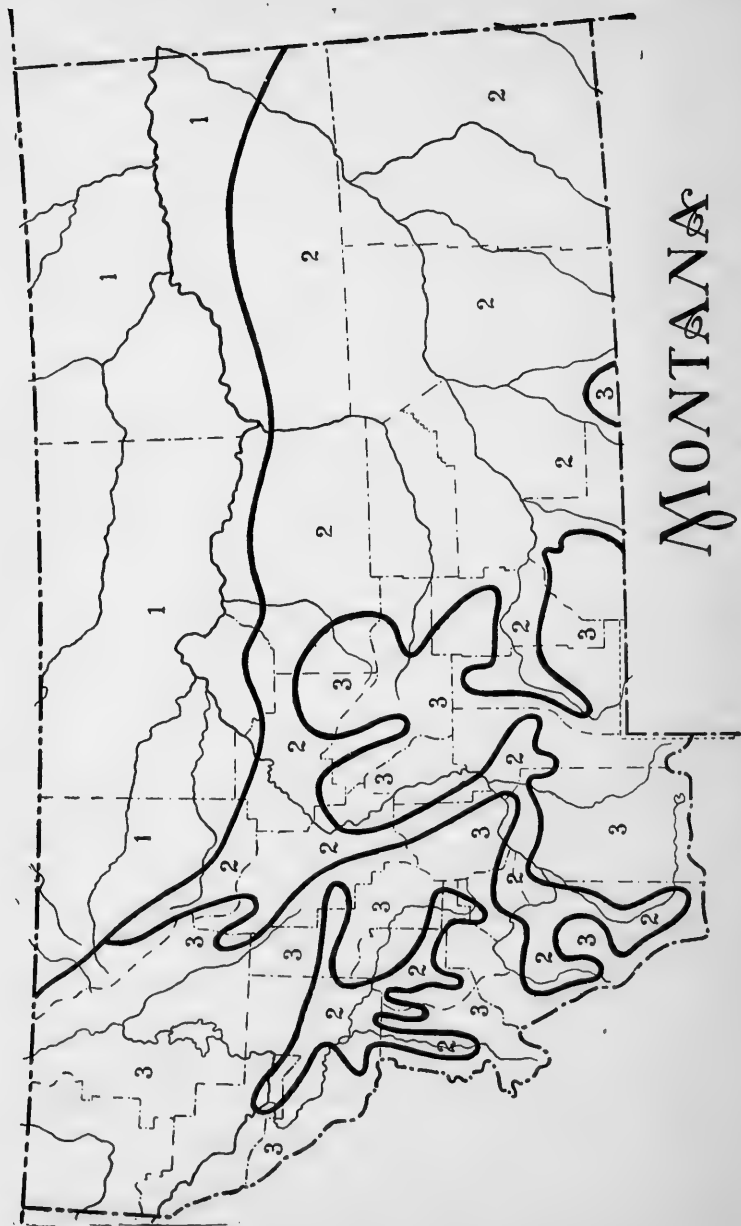
Further west in the vicinity of Fort Worth and Dallas north to the state line and south toward San Antonio there are extensive areas of black prairie soil. This is devoted chiefly to general farming and stock raising and it is a very prosperous region. Some grazing is still carried on, though most of the land is in cultivated crops. While cotton is grown quite extensively, diversified farming is the rule. Alfalfa does well, but is not raised as extensively as it should be. The opportunities

for general farming in this section and for trucking in the coast country are better than elsewhere in the state.

The Panhandle country is devoted to grain raising and ranching, with ranching on the decline and general farming on the increase. Land is now sold in small tracts for farms and settlement is rapid. The rainfall is limited and dry farming methods are followed with good success. The country is still young and there is a large amount of good land that can be bought cheaply.

What is known as West Texas consists of a vast region from San Angelo to El Paso and from the Panhandle to the Rio Grande. This is in an arid and semi-arid condition, the rainfall ranging from eight to twelve inches. While it is most all classed as grazing land it takes from fifteen to thirty acres to supply sufficient grass for one steer. Along the Pacos River and a few other streams where water for irrigation can be obtained, considerable development has taken place. The soil in itself is very rich but where water is not available the land has but little value at the present. Dry farming has been tried in some of the driest sections around El Paso with success, though development on a large scale along this line is not at all rapid.

Texas offers opportunities along almost all lines of agriculture from the raising of grain and stock to trucking and the growing of Satsuma oranges. Land values are lower than in the north and east and in many sections of the state there is still available good land which can be homesteaded. As much as a section of farming land can be taken up by one party. Larger amounts of grazing land can be secured.



MONTANA

MAP 20.—Soil and Agricultural Map of Montana.

Map Legend.

1. Region including soils of glacial origin. Considerable black prairie soil especially in eastern part. Becomes rougher toward west and is quite broken over considerable areas. Grazing chief agricultural feature at present. Some dry farming possible. Mostly in semi-arid region.

2. Rocky Mountain Valleys and Plains region. Includes extensive, undulating prairies, some fertile river bottom lands and considerable land that is quite rough. Irrigation practiced in number of places. Semi-arid country. Dry farming followed quite extensively. Grazing still important. Much unimproved land.

3. Western Mountain regions. Very rough and mountainous and as a whole of little agricultural value. Some small fertile valleys.

Montana.

Until within quite recent years Montana has not been looked upon as of much importance from an agricultural standpoint. Ranching was for a long time about the only agricultural interest receiving attention and this industry reached large proportions. While the rainfall is limited, the grass is very nutritious. Streams from the mountains provided water and the valleys afforded protection against severe storms, so that expensive shelters for stock were never considered necessary. Under these conditions the ranching business progressed until the homeseeker began to look for land in the cattle country. When the grazing lands leased from the government were thrown open for homestead entry the cattle business began to decline. The portions of the state suited to the cultivation of crops are now rapidly developing.

Much of Montana is rough and mountainous and unfit even for grazing, but there are numerous level valleys and extensive plains and elevated plateaus where irrigation and dry farming are now bringing agriculture in this state to the front.

From the standpoint of soils, Montana is divided into three general soil provinces. Most of the western portion of the state is included within the Western Mountain Region province. This is extremely rough and broken, and with the exception of some fertile valleys of comparatively small extent, this region is of no value agriculturally. Mining is the leading industry and will continue to be, though only a small proportion of the known mineral deposits are being worked at present. Extensive copper mines are in operation at present, and gold and silver are also found quite extensively.

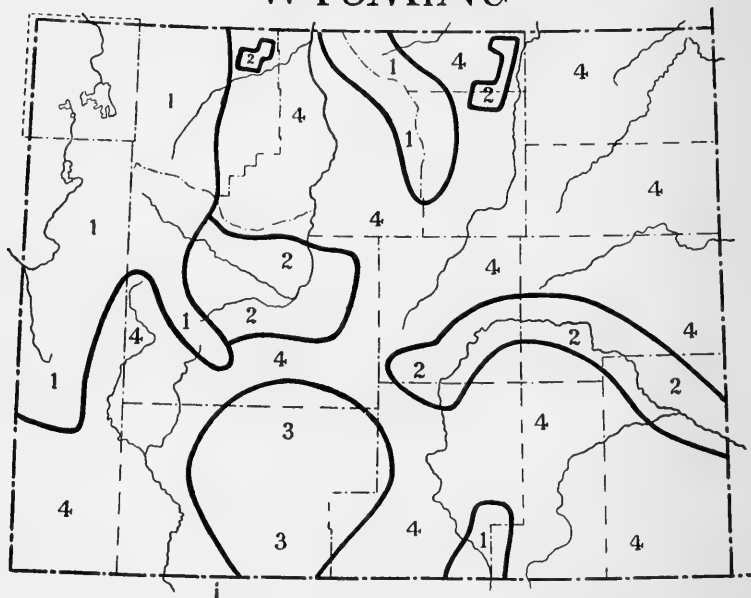
The north central and northeastern portions of the state are within the Glacial province and the soils were derived from the glacial debris left by the ice sheet which covered the region. The topography is rolling to broken, though not nearly as rough as the western part of the state. There are numerous valleys, the chief ones being along the Missouri, Milk and Marias Rivers. There are also some upland sections which are suitable for grazing and dry farming can be carried on over a portion of the region. In the valleys and wherever there is water for irrigation, this type of agriculture is being rapidly developed.

The southeastern portion of the state and numerous valleys in the western part are included in the Rocky Mountain Valleys and Plains province. This region embraces extensive plain or plateau areas where grazing was for a long time the only type of agriculture. At present dry farming is being carried on successfully in many places where the rainfall is sufficient. The Yellowstone, Musselshell, Bighorn and Powder Rivers supply water for numerous irrigation projects which are proving that Montana has great and important resources along the line of agriculture as well as mining.

It is necessary to irrigate or practice dry farming for raising cultivated crops in every portion of the state, since the rainfall is not sufficient to permit eastern methods to be used.

In the southern and western portions of the state in the irrigated valleys fruit is being successfully raised. Of other crops grown, peas, barley, oats, wheat, sugar beets and potatoes are the most important. Corn can be grown for fodder but it cannot be depended upon to mature with any degree of certainty. There are many opportunities for engaging in dry farming operations and irrigated lands can be secured at reasonable prices. Unimproved land suitable for irrigation can also be secured. Dairying will doubtless develop to a considerable extent. Improvement and settlement are taking place rapidly and land values are gradually advancing.

WYOMING



MAP 21.—*Soil and Agricultural Map of Wyoming.*

Map Legend.

1. Including the chief National Forest Reserves. For the most part rough, mountainous country.

2. Reclamation land. Regions where water can be obtained for irrigation purposes and where irrigation is now being carried on, though not over entire areas included. Sugar beets, alfalfa, small grains, peas, fruit and numerous other crops successfully grown.

3. Mostly desert country, suitable chiefly for winter grazing. Quite a large number of sheep raised.

4. Region over which farming, ranching and grazing are carried on. Some portions are quite rough and mountainous, while again there are extensive plains. Considerable mixed farming. Dry farming methods quite commonly followed.

Wyoming.

While Wyoming is one of the least developed of the states its agricultural and mineral resources are attracting wide attention and advantage is rapidly being taken of the opportunities presented. Within the state are diverse conditions of soil, climate and settlement. The transition from the great range stock business to the reclamation of extensive areas by irrigation and the establishing of small farms has made agricultural progress within Wyoming more rapid within the last ten years than during any previous period.

The census statistics of 1910 show that Wyoming's acreage in cereals increased 150 per cent more than any other state and in production and value the increase was from twenty-one to sixty per cent higher than the nearest competitor. Yet the surface has hardly been scratched and there are vast and numerous opportunities for the establishing of farms, homes and varied industries.

Three of the most important factors in the agricultural development of Wyoming are climate, irrigation and alfalfa. In various portions of the state, and especially in the Big Horn Basin these three are welded to a productive soil, splendid growing season and diverse cropping capabilities.

The topography of the state is extremely variable, ranging from mountainous in the western portion, and in various other parts of the state as well, to broad level plains, elevated plateaus, and valleys of all sizes.

The rainfall ranges from almost nothing in portions of the state to from ten to twenty inches in more favored localities. This makes irrigation necessary in raising cultivated crops,

except where the rainfall is sufficient to insure success by following dry farming methods.

The Big Horn Basin is probably destined to become one of the leading agricultural regions of the state. It contains from 12,000,000 to 13,000,000 acres, about one-sixth of which may ultimately be irrigated. It is a rolling country, with its agricultural land either in narrow valleys along streams or as more or less level plains or plateaus on the divides between the water courses. There may be miles of range land or chains of barren looking desert clay hills separating the farming communities. The irrigated oases vary in size from a few hundred or thousand acres irrigated by small ditches, to perhaps more than 200,000 acres in a body where great irrigation systems are being constructed. The whole country is surrounded by lofty mountains, whose protecting influence is felt throughout the region. The basin is traversed from south to north by the Big Horn River, which with its tributaries, contains sufficient water to irrigate several times as much land as can be brought under cultivation. The average annual rainfall secured from records covering ten years within the basin is only five and two-thirds inches, which means that irrigation is necessary in all parts of the basin.

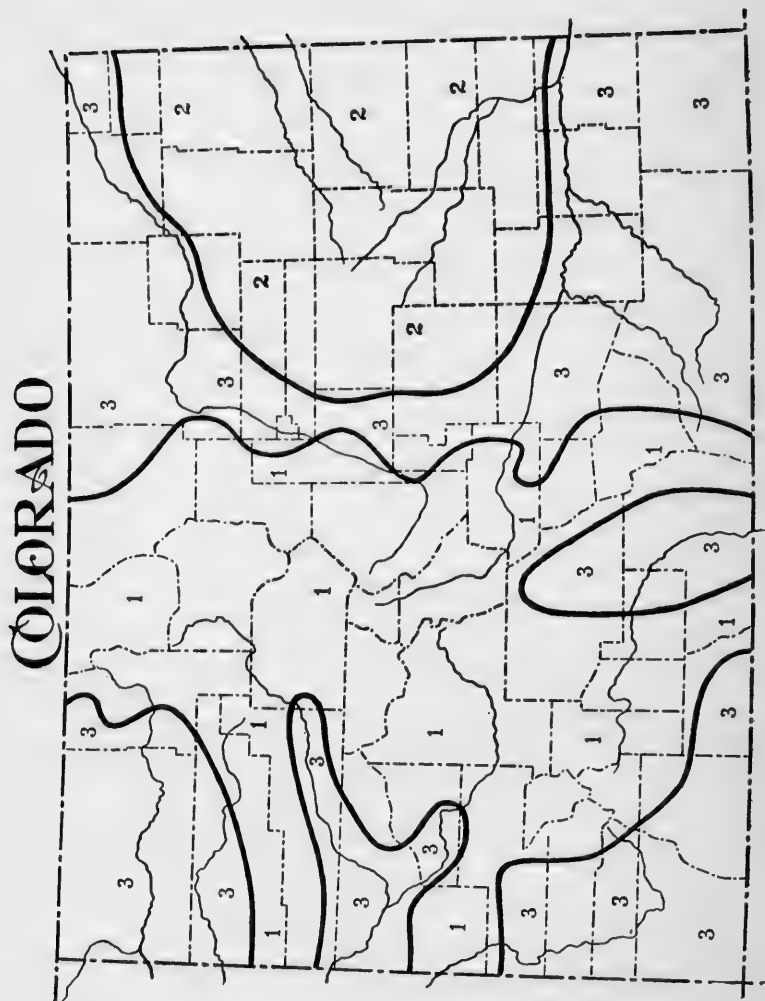
Under irrigation the most important crops grown are alfalfa, potatoes, sugar beets, some small grains as oats and wheat and fruits. Corn may be grown but the season is short and the nights too cool for the crop to mature with any degree of certainty. Where the rainfall is sufficient, dry farming is being carried on. To obtain the best results under this system it is necessary to exercise great care in the cultivation of the soil so that the moisture may be conserved. Inexperienced parties with limited means should first acquire a knowledge of the system by working under the supervision of practical dry farmers before an attempt is made to engage in this kind of agriculture. Wheat, oats, alfalfa, corn and a number of

other general farm crops, as well as garden crops, are raised under this system.

There are still thousands of acres of government land open to homestead entry where dry farming can be carried on and there are also some places where land suitable for irrigation may be secured. Indian lands are being opened up from time to time for settlement and a considerable portion of these lands will make good farms.

As Wyoming is in the arid and semi-arid regions, stock raising under the range system will always be an important industry. Cattle and sheep are still raised in large numbers, though many of the ranches have been cut into small farms. As the number of small farms increases, the amount of livestock in the state also increases, for under irrigation or dry farming the land will support many more animals than the open range, and still leave room for other lines than stock raising.

There is also great mineral wealth in the state, including coal, iron, gold, silver, copper, and many less known, though valuable minerals, and large tracts which have been proven to be oil lands. The agricultural and mining opportunities of Wyoming are worthy of consideration by those who wish to live in a region where the rainfall is limited and the air dry, cool and bracing. While the winters are long and cold the dry air makes the cold seem less intense than in humid regions.

MAP 22.—*Soil and Agricultural Map of Colorado.*

Map Legend.

1. Western Mountain Region. Extremely rough country and mountainous. Of no value for agricultural purposes, except for small amount of grazing furnished over limited areas. Extensive mineral deposits. Some small fertile valleys.

2. Chief grazing section of state where ranching was extensively carried on. Ranching now on decline and considerable farming carried on chiefly by dry farming methods. Extensive plains.

3. Regions in which agriculture is most highly developed. Raising of special crops and intensive farming receives most attention. Potatoes, melons, fruit, sugar beets, alfalfa chief products. Some irrigation carried on. Dry farming and some grazing also carried on in this region.

Colorado.

In general terms the eastern one-third of Colorado may be said to be composed of high plains, the middle one-third of Rocky Mountains, and the western one-third of plateaus, stepping down toward the Colorado River. Colorado has the highest average elevation of any of the states, it being 6,800 feet above the level of the sea.

The principal rivers are the North Platte, South Platte, Arkansas, Rio Grande, Yampa, White, Grand, Gunnison, Dolores and San Juan. None of these streams are navigable but they probably furnish more water for irrigation than the streams of any other state in the semi-arid portion of the country. Most of these streams are drawn upon heavily in aid of irrigation.

Colorado has an average rainfall of about fifteen inches annually and over the state as a whole there are over 300 days of sunshine each year, while in some sections there are over

340 days that are not cloudy. The state for a long time was considered too dry for agriculture, except in the alluvial bottoms along some of the streams. The soil over much of the state was known to be naturally very fertile and irrigation was therefore undertaken to utilize the lands outside of the stream bottoms, as well as to increase the productiveness of the lowlands. Since 1880 over 20,000 miles of main canals have been constructed and an equal mileage of laterals. Over 3,000,000 acres are already under irrigation and as much more is suitable for irrigation which the plow has never touched. The portions of the state now under irrigation are adjacent to the streams above mentioned and in all of these regions the amount of irrigated land could be extended.

The crops grown within the state consist of wheat, corn, oats, hay, barley, Canadian peas, potatoes, cantaloupes, sugar beets, and all kinds of vegetables. Alfalfa is a very important crop. Dairying is an important industry in many sections and the raising of livestock is one of the chief older branches of farming. The fruit industry is very extensive and apples, peaches, pears and other fruits of excellent quality are successfully and profitably grown.

There are many portions of the state where water for irrigation is not available but where the rainfall is sufficient so that dry farming methods can be successfully employed.

There is still a very large amount of land in the state which is open to homestead entry and some of this land will in time be irrigated.

The special characteristics of the climate in Colorado are a comparatively equable temperature, minimum precipitation, low humidity, minimum wind movement, maximum sunshine and bracing effects. There are a few cold days in winter and some hot days in summer, but seldom the extremes of either.

No state in the Union has greater or more diversified partially developed resources than Colorado, and no other state

presents a greater combination of advantages and attractions to the desirable, intelligent "Home Seeker."

Today, while the total population of Colorado compares indifferently with the individual population of most of the Middle and Eastern states, Colorado is probably producing more new wealth per capita per annum, than any other state in the Union, and from a wider range of resources.

Moreover, Colorado, with a present population of upwards of 1,000,000, is still in its infancy and is fully capable of supporting a population of millions. The stream of "Home Seekers," more particularly from the Middle states, is increasing month by month. Every excursion train brings scores of farmers to Colorado. Agricultural land is selling at a comparatively rapid rate and new settlers, with their families, are flocking in. Much the same is true as to the new arrivals in the cities and towns.

The valleys of the South Platte and the Arkansas, on the eastern slope, present vast opportunities for more farmers, and could well maintain treble the present population. On the plains of eastern Colorado 39,000 square miles of non-irrigable land, as yet untouched by the plow, present unlimited possibilities, but only for the right kind of people. To the south, the great valley of the San Luis, as large as the state of Connecticut, is well capable of supporting a larger population than the whole of Colorado now has. Similar opportunities are presented for farmers and fruit growers in the valleys of the Grand and the Gunnison on the western slope; also in the Montezuma valley in southwestern Colorado. Northwestern Colorado, now being opened up by the Moffat railroad, with the completion of that road, will, within a comparatively few years, increase its present population of 10,000 to scores if not hundreds of thousands.

All this increase of development and population means enhanced values of the property of those who locate now.

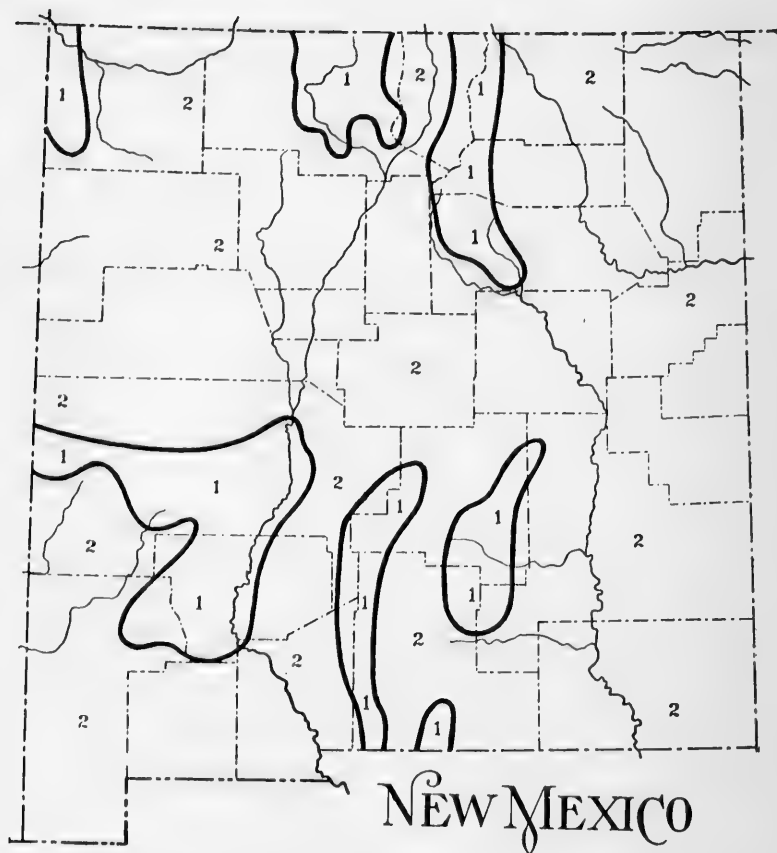
Throughout Colorado there is a shortage of metalliferous miners, coal miners, unskilled male labor, domestic help, etc.

The opportunities in the cities and towns are many and varied for people of some capital and for wage earners in some lines.

The success of new arrivals in Colorado necessarily depends largely on themselves; on their mental, physical and financial equipment; on their judgment, sobriety, industry, persistence, adaptability, etc.

Very many of the present citizens in good financial circumstances, have made in Colorado all that they have. Others have lost some of the money they originally brought with them. Much depends on the people themselves.

For the right kind of people, there are as good opportunities in Colorado today as there ever have been in the history of the state.



MAP 23.—*Soil and Agricultural Map of New Mexico.*

Map Legend.

1. Western Mountain Region. Very rough and mountainous and of little agricultural value except for small amount of grazing afforded.

2. Rock Mountain valleys and plains. Sheep, cattle, horses and goats. While grazing of chief importance, considerable areas are devoted to cultivated crops and cultivated areas increasing quite rapidly. On the high plains and mesas where rainfall is greatest, from sixteen to twenty inches annually, fair success is obtained. Dry farming methods are followed in some regions. The most important agricultural districts, however, are in the valleys of the Rio Grande, San Juan, Mimbres and the Canadian Rivers and their tributaries where irrigation is being carried on. Alfalfa, grains, fruit and general farm crops grown successfully in state. Some truck also raised and small amount of dairying.

New Mexico.

New Mexico lies within the arid and semi-arid portion of the United States. The rainfall over the greater portion of the state ranges from ten to twenty inches annually, though the extreme southwestern corner of the state has a rainfall considerable lower than this and some of it is in a desert condition. The portion of the state having the most rain is in the northeastern section and here there are large tracts of land where dry farming is being successfully practiced. Fair crops are often raised by the usual methods of farming, though such methods will not insure a crop each year.

In the valleys of the Pacos and Rio Grande Rivers several irrigation projects have been installed and excellent crops are being grown. The soil in these valleys is naturally very pro-

ductive and when water is supplied there is almost no limit to the crops which can be produced. The writer visited a field of alfalfa which was cut eight times during one year and eight tons of cured hay was the yield per acre. In the Rio Grande Valley the United States government is now building a large dam across the river at Engle and it is proposed to irrigate nearly 200,000 acres in New Mexico, Texas and Old Mexico. When this vast area is all under irrigation it will be one of the garden spots of the world. The altitude is over 4,000 feet, the air is clear and pure and the summers are much more pleasant than in low, humid regions. The winters are very mild and the climatic conditions are such as to suit the most critical. The region is adapted to the growing of pears, plums, apples, strawberries, alfalfa, potatoes, all general farm crops, including cotton and a broad range of other fruits and truck crops.

In the valley of the Pacos River water for irrigation is obtained from the river and also from deep wells. There are numerous places where small irrigation projects could be installed and made to yield very profitable returns.

Throughout the state there is a large amount of government land which is still open to homestead entry.

Mining is an important industry in various parts of the state and the mining camps furnish a good market for a considerable amount of farm produce. The state is traversed by several important railroad lines connecting directly with the large cities of the west and the east. The produce not consumed by the local markets goes chiefly to the cities of the middle west and the east.

MAP 24.—*Soil and Agricultural Map of Idaho.*

Map Legend.

1. Agricultural lands, irrigation not essential—rich black soil—mostly prairies. Grains, fruits, cattle, horses and hogs.

2. Agricultural land and grazing. Irrigation necessary in places, though over large tracts irrigation impossible because of limited water supply.

3. Irrigation necessary. Agricultural and grazing lands. Alfalfa, fruit. Mountains rich in mineral.

4. Very mountainous.

Idaho.

There are portions of the state of Idaho which are rapidly coming to the front as agricultural regions, though the major portion is too rough and mountainous for the production of cultivated crops.

The soil provinces represented in the state are three in number. The Great Basin Province is confined to a narrow strip along the southern border. The Northwestern Inter Mountain Region occupies most of the southern part and extends northward along the western boundary. The northern and eastern sections are within the Western Mountain Region Province and this section is very rough. The mountains throughout the state abound in mineral and a number of mines are in operation.

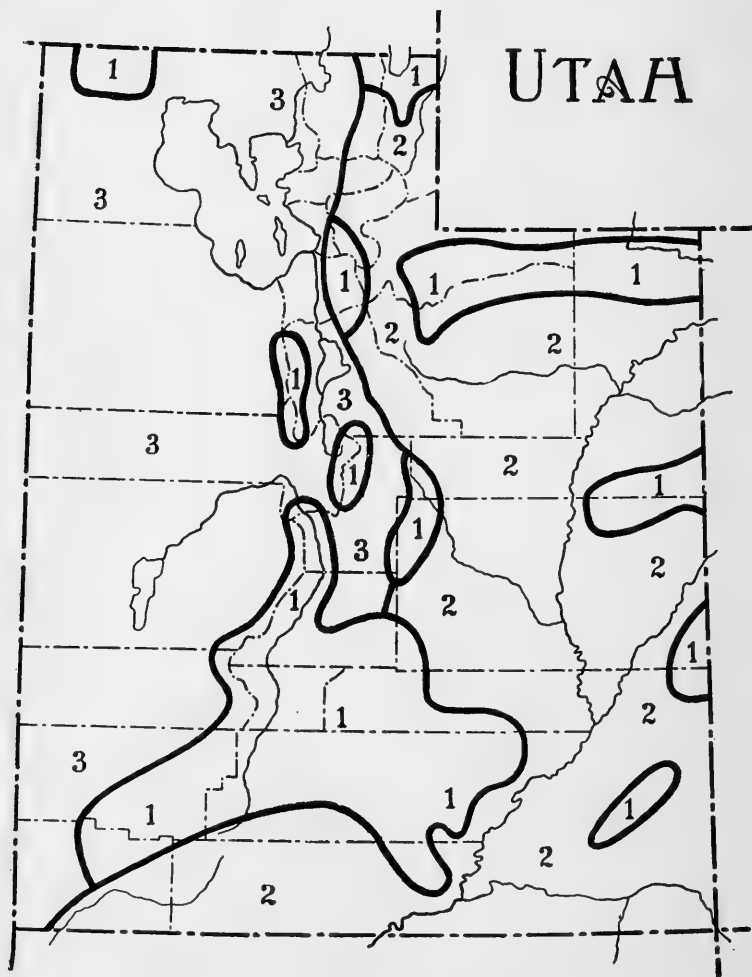
The most extensively advertised line of farming is that which is carried on under irrigation. Most of the best land suitable for irrigation, and also the largest number of irrigation projects are located along the Snake River and its tributaries. Throughout this region the best results can be attained under irrigation, though in some places irrigation is not essential. The fruit raising industry is developing quite rapidly

and some very good results have been attained. General farming is also carried on with good success and all small grains, corn and alfalfa are profitably grown.

To the north of the Snake River is a scope of country in which dry farming can be successfully practiced in places and there are also tracts which have water available for irrigation. Grazing is still an important industry in this section. On the rich, dark colored prairies grain is extensively grown without irrigation and fruit can be produced successfully.

In the northern and eastern portions of the state most of the land is too rough and mountainous to be of any value for agricultural purposes. There are a number of small valleys, however, through nearly all the rough regions, where the soil is rich and will yield excellent returns when put under irrigation.

Land values are not as high as further west, along the coast, and the opportunities for investment and for engaging in farming are good.



MAP 25.—*Soil and Agricultural Map of Utah.*

Map Legend.

1. Mountainous regions—surface very rough and broken and of little agricultural value. Provides small amount of grazing in places. Mineral deposits form greatest value of the region.

2. Rocky mountain valleys and plains. Grazing chiefly. Some irrigation practiced with success. Large tracts of land which could be irrigated and more highly developed. Alfalfa an important crop. General farming and fruit growing important. Large amounts of unimproved land. Rainfall limited. Some dry farming practiced.

3. Great Basin region. Very dry country, requiring irrigation for the successful production of most crops. Grazing carried on to some extent, though the growth of grass is scant. Dry farming practiced successfully in numerous places.

Utah.

Utah lies within the arid and semi-arid regions of the United States and only a comparatively small percentage of the state is improved agriculturally. The rainfall in eastern, western and southern Utah ranges from naught to ten inches annually. These sections are mostly rough and mountainous, with some valleys, benches and plateaus which would be suitable for farming if water could be supplied.

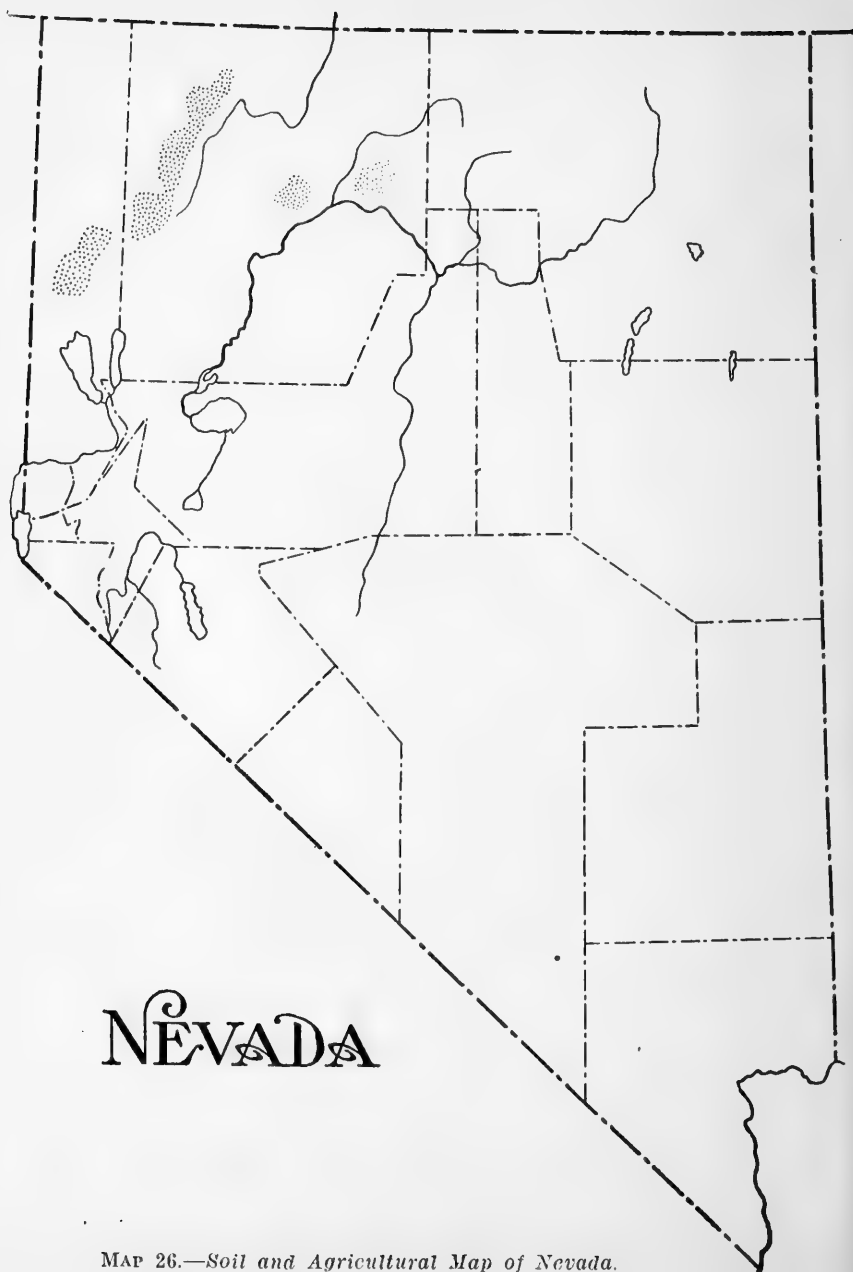
In the central and north central parts of the state the rainfall is from ten to twenty inches annually and this region includes the most highly improved portion of Utah. Some dry farming is practiced and some crops are grown under the usual methods of cultivation. The greatest success, however, is attained where the land is irrigated. Large amounts of land in this region can be made ready for irrigation with comparatively little labor and where water is available splendid results

are obtained. General farming is carried on and small grains, corn, alfalfa, sugar beets, fruit and truck are the chief agricultural products. Fruit raising is an important industry in several localities and apples, peaches, pears and small fruits of excellent quality are produced.

The opportunities along the line of agriculture in Utah are in irrigation farming and in this field there are numerous localities not yet improved which present good openings.

Mining is carried on quite extensively in various parts of the state and this industry also presents an inviting field for investment.

Ranching is still receiving considerable attention and where water is not available for irrigation and where the rainfall is not sufficient to make dry farming successful, ranching will remain the leading industry since the land in this condition is not suited to anything but grazing.



MAP 26.—*Soil and Agricultural Map of Nevada.*

Nevada.

Nevada lies almost entirely within the region known as the Great Basin, and its agriculture is confined to a comparatively few small irrigation projects and to grazing. Rainfall very limited and future agricultural development must necessarily be very much restricted. Dotted areas indicate desert land.

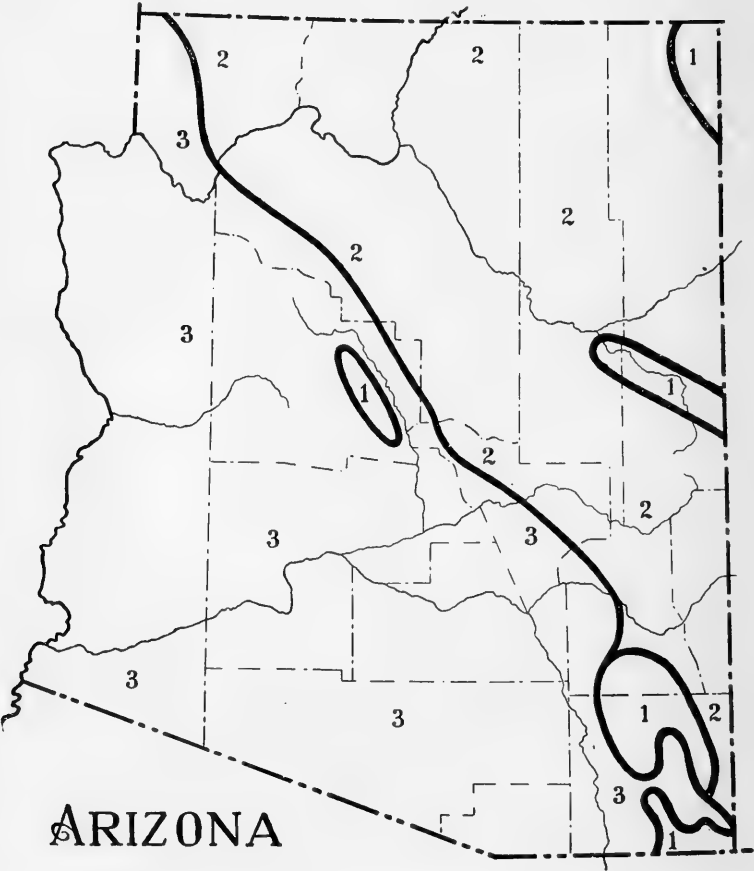
Over the major portion of Nevada the rainfall ranges from naught to ten inches annually. The only exception to this is in the northwestern corner where the rainfall varies from ten to twenty inches. An arid condition prevails throughout most of the region and because of this the raising of cultivated crops under the usual methods of farming is impossible. In topography the surface is mountainous for the most part, though the region lies largely within what is known as the Great Basin, and on account of the rough character of much of the country it would not be well suited to agriculture even under humid conditions. There are numerous valleys and benches where cultivated crops could be grown if water were available, but in Nevada water is a very scarce article, therefore it cannot be classed as an agricultural region.

Mining is the leading industry in Nevada and there are opportunities for the extension of this field since there are undoubtedly many large mineral deposits which have not as yet been located.

Ranching is the chief type of agriculture practiced and this is confined most largely to the northern part.

Some land in Nevada is being irrigated and very satisfactory results are being obtained. The United States Government installed the Truckee-Carson irrigation project which is proving to be a great success. There are other smaller projects and also some localities where similar improvements could be made. Most of the farm produce from these irrigated sections is sold to the mining camps where very good prices are always obtained.

The rainfall is so small that dry farming can be practiced only over limited areas and as yet this has received but very little attention.



MAP 27.—*Soil and Agricultural Map of Arizona.*

Map Legend.

1. Western Mountain regions. Very rough country of no value for agricultural purposes except for a very small amount of grazing.

2. Rocky Mountain Valleys and Plains. Rainfall more abundant than elsewhere in state. Grazing of chief importance. Some general farming by dry farming methods, chiefly.

3. Arid Southwest. Includes some of the driest portions of the United States. Small amount of grazing, but grass very scant. Much waste land.

Most of the farm crops raised in the state are grown under irrigation along the Gila, Salt and Colorado Rivers and their tributaries. Alfalfa important crop. Some dairying, considerable fruit, corn, small grains and truck crops. Some citrus fruits.

Arizona.

Arizona is one of the states having the least rainfall of any section of the United States. The annual precipitation ranges from naught to twenty inches. In the western and southwestern portions an arid condition prevails and the rainfall is from naught to ten inches while in the eastern portion of the state as high as twenty inches of rain may fall within a year.

The mountains throughout the state are rich in mineral deposits and mining is an important industry. The mining camps furnish good markets for considerable farm produce.

From an agricultural point of view the state as a whole is best suited to grazing, and ranching is the most extensively developed type of agriculture. From twenty-five to thirty-five acres are required for each head of stock.

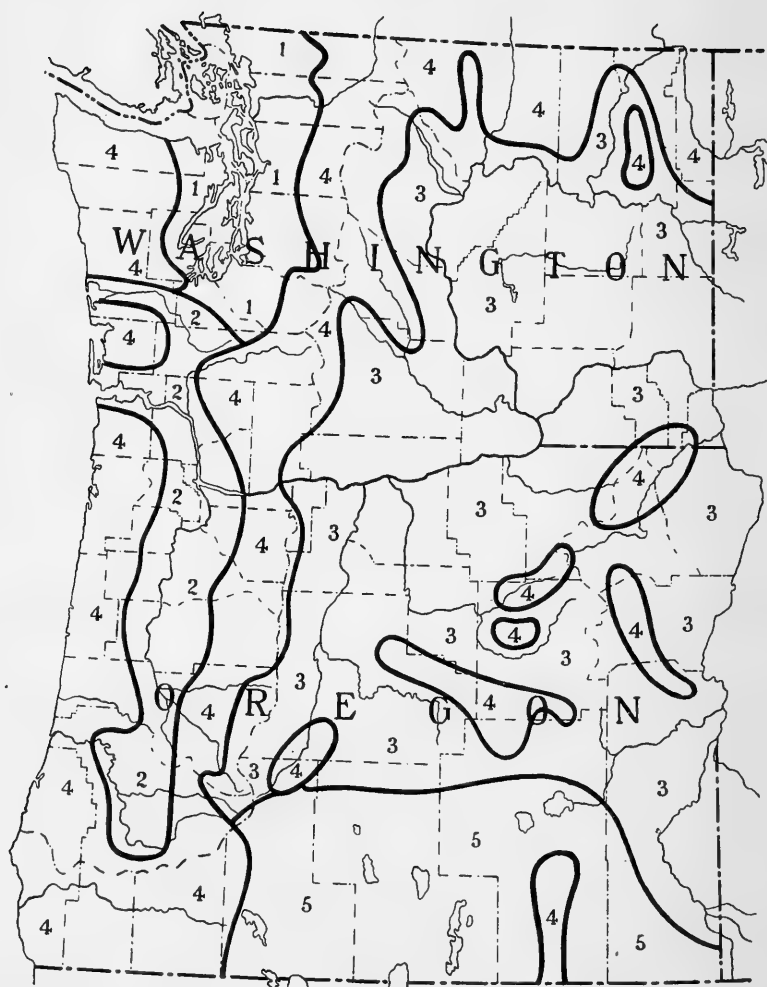
At the present time considerable attention is being given to the question of irrigation. There are a number of small pro-

jects throughout the state and wherever water is applied to the land very good yields are secured.

The United States Government has recently built a large dam sufficient to retain water to irrigate an extensive tract in the valley of the Gila River and tributaries. The climatic conditions are such that oranges, dates and other semi-tropical fruits thrive. Alfalfa does especially well and the general farm crops common to both north and south can be successfully grown. Wherever there is any possibility of irrigating land in this state and wherever the land is within a reasonable distance of railroad lines or in a section which will soon be provided with transportation facilities, such sections present excellent opportunities for investment and for agricultural development. The soil is naturally very fertile and with a supply of water available very gratifying results can be secured.

Where the rainfall is from fifteen to twenty inches dry farming can be carried on successfully and this system is followed to a limited extent. There is a large amount of public land still open to homestead entry.

The climate of the state is considered very healthful and while the heat on the deserts and in some of the valleys is almost unbearable during the day time throughout the summer, the higher altitudes are free from this excessive heat and the climate is delightful throughout the year. Where the temperature is the highest throughout the day, the nights are usually sufficiently cool so that one may sleep in comfort.



MAP 28.—Soil and Agricultural Map of Washington and Oregon.

Map Legend.

1. Glacial soils. Considerable land highly improved. General farming, dairying and fruit. Trucking and a number of special crops. Rainfall abundant and irrigation not necessary.

2. Pacific Coast Soil province. Good agricultural region well improved. General farming, fruit, livestock, and some dairying.

3. Northwestern Intermountain region. Extensive areas of level and gently rolling land mostly with limited rainfall. Grazing, dry farming and grain raising chief industries. Considerable irrigation along rivers and excellent fruit and great variety of farm and garden crops produced. Land under irrigation and in fruit very valuable.

4. Western Mountain regions. Rough mountainous country of little value for agriculture except for grazing. Mineral deposits of value found in these sections.

5. Great Basin. Low rainfall. Arid region. Chiefly a grazing country, with scant growth of grass.

Washington.

The state of Washington is divided into three divisions by mountain ranges. The first section lies between the coast and the Olympic Mountains and is rough and rugged. The second lies between the Olympic and the Cascade Ranges and includes the Puget Sound region and a strip of country extending south to the Columbia River. The third extends from the Cascades east and includes the Okanogan Highlands, Columbia River Plains and the Blue Mountain District and is commonly known as the Inland Empire.

From the soils standpoint the state is divided in four provinces. The Western Mountain Region Province includes the Olympic and Cascade Ranges, the mountainous regions in the northern and northeastern part of the state and a small region

in the southeastern portion. This region is extremely rough and mountainous and has little agricultural value. It furnishes grazing land and is of use for forestry purposes. A large amount of good timber is still found in this province.

The region immediately around Puget Sound is within the Glacial Province and the soils are more variable than in other sections of the state. It is of comparatively small extent, though important for the amount of development which has taken place.

The Pacific Coast Province includes the region immediately south of Puget Sound and includes the inter mountain section extending southward into Oregon. This is also an important section of the state.

The Northwestern Intermountain Region includes the central, eastern and southeastern portions of the state and embraces a broad stretch of country in which the vast agricultural resources are only partially developed.

The rainfall is extremely variable in different sections of the state and ranges from between sixty to eighty inches along the coast to less than ten inches east of the Cascade Range. East of the Cascades irrigation or dry farming methods are necessary if the best results are to be obtained with cultivated crops. Under irrigation wonderful results have been obtained with fruit and also general farm and garden crops, while dry farming methods produce excellent returns where irrigation is not possible. The Columbia and Snake Rivers and smaller streams furnish a large supply of water for irrigation purposes.

West of the Cascade Range the rainfall is abundant and irrigation is not necessary.

There are four types of farming followed in the state, though they are not distinctly separated on many of the farms. General farming and the raising of small grains is probably the most extensive type of farming. Grazing and the raising of horses, cattle and sheep has long been an important industry and grazing will continue to be important in regions where the land is too rough to be irrigated and where dry farming cannot be suc-

cessfully carried on. The fruit industry probably attracts more attention than any other line of farming in Washington and it is developed on a commercial scale in a number of localities. The income from the orchards is extremely large and the acreage is constantly being increased. The hop growing industry is still important, though not as extensive as formerly.

Land values are extremely high in most sections of the state and it seems that future possibilities have been capitalized to a very great extent. Along the coast where the rainfall is heavy and the natural growth is dense, the cost of clearing land is very high. The soils in the irrigated and unirrigated regions are naturally very productive and large and profitable yields are secured.

Taken altogether Washington offers many very good opportunities along the line of agricultural development. Mining and lumbering are also important industries.

Oregon.

Agricultural operations in Oregon are largely controlled by the amount and distribution of the rainfall. The precipitation is extremely variable in different portions of the state and ranges from over eighty inches along the coast to less than ten inches in the north-central portion of the state. Irrigation is practiced in some portions of the state but the total acreage under the ditch is still comparatively small.

The soils of the state fall naturally into four more or less distinct provinces. The Western Mountain Regions Province includes the greater part of the western one-third of the state, with the exception of a quite extensive inter-mountain area extending south from Portland to some distance south of Roseberg. There is an area of this province in the northeastern corner of the state and several in the east-central portion. All of this province is rough and mountainous, and while there are numerous valleys and some benches where farming operations are carried on, the major portion of the region is not well suited to agri-

culture. There is considerable grazing land, some fruit land and much steep and rocky land. The rainfall on this province in the west is abundant but in the eastern portion it is not sufficient in all cases for farm crops, so that even where soil conditions are favorable the moisture supply may be too limited to permit successful farming.

The Pacific Coast Province occupies the inter-mountain region south of Portland and includes the valley of the Willamette River. In this province agriculture is well developed and there are many highly improved extensive tracts of land. The rainfall is from thirty to sixty inches or over per year and farming operations are carried on without the needs of irrigation. The soil in general is of the heavier textures and naturally productive. Fruit raising and general farming are the leading types of agriculture. The farms on the average are small and methods intensive.

The Northwestern Inter-mountain Regions Province is the most extensive in the state and includes most of the central, north-central, and eastern portions. The rainfall here varies from less than ten inches to slightly over twenty inches on some of the higher elevations. The region as a whole is but slightly developed, though there are a number of localities in which agriculture is highly improved. Along some of the valleys tributary to the Columbia River in this province and also in the Western Mountain Region Province the fruit industry is very important. Irrigation is practiced quite extensively and dry farming methods are carried on to a considerable extent. Grain raising is an important industry and ranching is also carried on to a considerable extent. There are very extensive tracts of land which would be excellent for general farming and for special lines of agriculture if a supply of water were available for irrigation. There are also tracts which can be irrigated from streams nearby and which are still undeveloped. There are numerous opportunities along the line of irrigation farming

throughout this region and dry farming could also be extended where water is not available and where the rainfall is fifteen inches or over. Much of the country is level to gently rolling and rolling and farm operations can be readily carried on on a large scale.

The Great Basin Province is confined to the south central and southwestern portion of the state and is also but slightly developed. The rainfall is from ten to fifteen inches per year and there is but little water available for irrigation. For this reason it has remained chiefly a stock country, with a small amount of dry farming carried on.

Oregon, especially the western portion, is favored by a mild climate and a long growing season, as is the case in Washington, owing to the modifying influence of the Japan current. This permits the development of the fruit industry and the growing of numerous tender crops which could not be raised in the same latitude further east.

Wherever agriculture is highly developed, as about the fruit centers such as Hood River, values are very high. Away from these centers there are tracts of good land which can be bought at reasonable prices. The state as a whole still has much good land which is not improved and there are many opportunities worth investigating.



MAP 29.—*Soil and Agricultural Map of California.*

Map Legend.

Temperature Zones, Rainfall, and Topographical Divisions.

A. Mean annual temperature, thirty to forty-four degrees. Rainfall, thirty to seventy inches. Highest portions of state rough and mountainous.

B. Mean annual temperature, forty-four to fifty-two degrees. Rainfall, twenty to seventy inches. Mostly foot-hills, with some mountainous regions.

C. Mean annual temperature, fifty-two to sixty degrees. Rainfall, ten to twenty inches along south coast, increasing to sixty to eighty inches along north coast. On table lands usually less than fifteen inches. Coast country and table lands. Very equable climate. Irrigation necessary where rainfall is limited.

D. Mean annual temperature, sixty to sixty-eight degrees, same as prevails in Mississippi, Alabama and Georgia. Rainfall, ten to twenty inches. Much valley land highly improved. Some coast country. Much land irrigated.

E. Mean annual temperature, sixty-eight to seventy-two degrees. Very high afternoon temperatures during summer months. Large part of year temperatures moderate. Very dry, arid region. Irrigation necessary. Rainfall less than ten inches.

F. Mean annual temperature, forty-four to sixty degrees. Rainfall less than twenty inches. Highly elevated plateaus. Some irrigation practiced.

California.

California is attracting wide-spread attention. Few sections of the country have so attractive a country life, and few have promise of a greater future or offer better returns for investment in farm lands. The subdivision and placing under irrigation of many of the large ranches has changed the entire agri-

cultural industry. Where before stretched untold acres belonging to one estate, there are now hundreds of twenty and forty acre farm homes well kept, carefully cultivated and yielding a good living. Instead of the big ranch with its hundreds of hands we now have the small intensively cultivated irrigated farm, where the owner can personally attend every tree and vine and get the highest possible production.

There are two great mountain ranges running north and south through the state, the Sierra Nevada, with the Great Yosemite National Park and Lake Tohoë, and the Coast Range, and an arm thrust across from east to west, called the Tehachapi. About one-fifth of the state lies below this barrier. At the north, Mt. Shasta unites the two principal ranges. There are a few overlapping spurs, and the Coast Range is somewhat broken, and in places doubled, with small valleys between, and there is much agricultural land between the ocean and the coast mountains, but the Great Central Valley holds the bulk of the farming land. It is called by two names, the Sacramento and the San Joaquin, after the two rivers which drain it from opposite ends.

Below the Tehachapi Mountains lies Southern California. The coast swings sharply eastward at Point Conception; the Coast Range breaks down in places and disappears, and the whole interior is more open to the sea. For 150 miles an extensive plain faces the Pacific. It runs back from fifteen to fifty miles and gradually merges into the foothills or rolling country. The Sierra Madre and the San Bernardino Mountains take the place of the Sierra Nevada.

California is probably the most wonderful state in the Union with regard to temperature. It is not so much that extreme heat and extreme cold occur at times, as it is that within short distances one can find climates that are very different. Thus it might almost be called an adjustable climate. The map brings out not only mean temperature conditions, but the different kinds of climate which may be said to prevail in Cali-

foria. Thus the area marked D shows that the mean of all temperatures recorded during the year in that area ranges from sixty to sixty-eight degrees. In other words, this is the same mean temperature as prevails in Georgia, Alabama, Mississippi and most of Texas; but this does not mean that from day to day, or from month to month, the temperature does not go higher or lower, because as a matter of fact, the normal temperatures for summer in this section exceeds eighty degrees, and in winter average forty degrees. What the map does show is that this great inland valley, the combined Sacramento and San Joaquin, has a climate different from that prevailing in the foothills, and this in turn differs from the climate of the mountains, which again differs from the climate of the high Sierra or the Siskiyou, or the higher peaks of the Coast Range. Nor does the fact that unusually high temperatures occur in some portions of the state necessarily mean that these temperatures are comparable with the same figures elsewhere in the United States.

In some portions of California, especially that section shown on the map by E sixty-eight to seventy-two degrees, very high summer afternoon temperatures occur, in fact, exceeding those reported anywhere else in the United States. Yet it is perfectly true that the air is at such times very dry and there is less physical inconvenience and suffering than would prevail if there was a high degree of humidity. In brief, readings of the thermometer which would be intolerable elsewhere, are tolerable, though not pleasant, in these sections of the arid west. During a large portion of the year temperatures are moderate and the weather as a whole delightful.

Again, with respect to the coast climate, where the average temperature is about fifty-six degrees, there are few very hot or very cold days. It is the most equable climate of the United States in the matter of temperature. Yet temperature alone does not tell the whole story. For many people this climate, despite its equability, is over-stimulating and too rigorous.

To people in good health, however, the climate is bracing, and means a working efficiency of a full day for every day in the year. But over and above all, the charm of California's climate is that within a short distance, often not so much as ten miles, one can find the climate best adapted to his needs.

The map is valuable because it shows at a glance the climate of the great natural divisions of the state. The terms "northern" and "southern" have little, if any, horticultural significance in California. Citrus fruits flourish in the Great Valley and in the foothills equally well as in the great orange belt south of the Tehachapi. Deciduous fruits are grown both in the north and in the south. Valley climate is adaptable in many ways as the choicest foothill climate. Naturally the great industries seek the lower levels and localities approximate to railroads and seaports, but the hills and uplands, while as yet for the most part undeveloped and sparsely populated, have great possibilities, and in the matter of climate have many advantages over the lowlands.

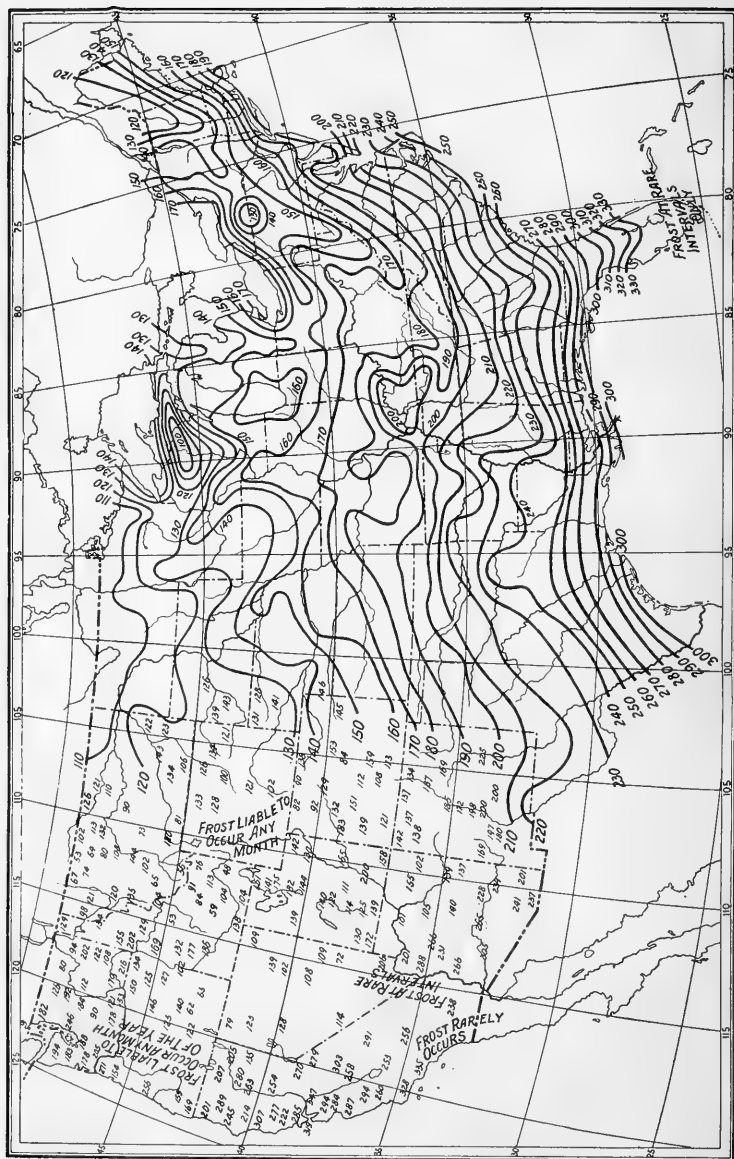
As for the mountains, they are at once the glory and the strength of California. Although represented on the map with the area of temperature "A," ranging from thirty to forty degrees, the normal winter temperature is about the same as that of Virginia, Kentucky, or Missouri, and far below the normal surface temperatures occurring in midwinter in most of the northern states.

Naturally with such a diversity of climate, there is a great diversity of human interests. Farming is easily the leading industry. Barley, wheat, oats, corn, rye and other grains; hay, alfalfa, potatoes, beans, hops, beets, field and garden seeds are raised easily and with profit by the farmers. Fruits grown in California are famous the world over. Oranges, grapes, raisins, peaches, pears, plums, apricots, olives, and nuts yield revenue exceeding in the grand total all other field products.

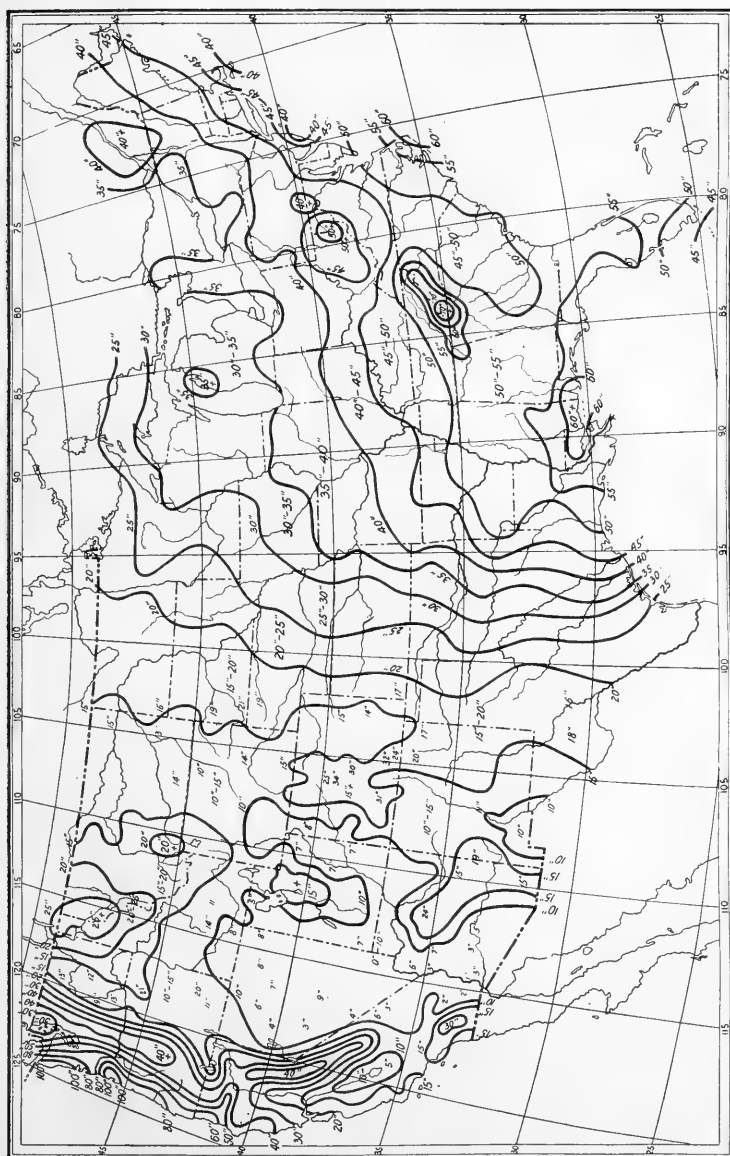
California offers a very attractive farming region. This comes from the wonderful climate and the fertility of the soil.

Few regions produce so great a variety of crops. The products of New England, of the middle west, of much of the south, of Italy, Spain, Persia, Greece, and Sicily are grown here, and he is a poor farmer who cannot, when the growing season almost corresponds with the months of the year, find a crop which he can produce successfully and make pay.

California is also a land rich in mineral wealth and in forests; but when all is said and done, California's greatest asset is her climate.



MAP 30.—Showing Average Length of Crop Growing Season by Days.



MAP 31.—Showing Average Rainfall throughout the United States.

CHAPTER VII.

WESTERN CANADA.*

Canada spreads over more than half the map of North America. It is considerably larger than the United States, with Alaska added. Politically, Canada consists of nine full-fledged provinces (Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia), and to the north of these a northern Canada consisting of the Yukon west of the Rocky Mountains, and the Northwest Territory east.

It is, however, with the three prairie provinces of Manitoba, Saskatchewan, and Alberta and the Pacific province of British Columbia, that this geographical sketch will deal.

Five times bigger than Great Britain and Ireland, and three times the size of the German Empire, prairie Canada constitutes the world's greatest wheat farm, a plain 1,000 miles long and of undetermined width. This fertile prairie is watered by three giant river systems. The Assiniboine and the Red drain Manitoba; the great Saskatchewan waters central and southern Alberta and the province of Saskatchewan; while the Peace, the mighty Athabaska, and the Slave Rivers are nature's highways through northern Alberta. Canada's river ways and lakes make of this last best west one vast network of sunny slopes and fertile valleys. More than farms are making on these prairies. Here, on a wheat plain wider than that of Russia, richer than those of Egypt, India, or the Argentine, out of strangely diverse elements a new nation is arising. The map of today shows us a

* The material forming the chapter on Western Canada has been taken largely from reports issued under the direction of the Minister of the Interior, Ottawa, Canada. The figures given are from the most recent statistics and other official reports and are as nearly correct as it is possible to obtain.

wide wheat plain dotted by the people of the earth, with an ever-lessening unsurveyed region. Year by year, these maps change their complexion, and the "edge of cultivation," with the advance of colonization, having entered the Rockies in its western advance, now moves steadily northward.

The St. Lawrence basin of eastern Canada was at first considered frost-bound and sterile, the Fraser lands of British Columbia rocky and inaccessible, and the valleys of the Red and the Saskatchewan too far north to support a white population. Now all these basins are occupied, and the sons of the men who saw these lands developed, are in turn laying strong hands upon the basins of the Peace, the Mackenzie, and the Athabaska, and platting townships in the latitude of fifty-eight degrees.

Canada is a country with a meagre past, a solid present, and an illimitable future. The railways of western Canada gridiron a prairie land of 200 million fertile acres, only a fraction of which is cultivated, yet this produced in 1910—a bad year throughout the American continent—approximately 258,000,000 bushels of wheat, oats, barley, and flax, of which 105,000,000 bushels was wheat.

CLIMATE OF CENTRAL CANADA.

The first enquiry of the would-be settler is, "But what about your terrible weather?" Many writers on Canada taboo the weather, but this subject, like most, is best attacked from the front. Western Canada has a cold winter, and people seeking tropical climate should not come here. It is the fervid sunshine of summer, followed by the cold, clear winter, which combine to give to Canada's No. 1 wheat its peculiar value over all other wheats in the world. This invigorating climate of western Canada does more than this—it helps to breed a hardy race. The law of growth—running through both animal and vegetable realms—is that plants and animals alike attain their fullest development in the most northern range of their habitat. The same rule applies to man. History and geography both show that

all the worth-while accomplishments of the world have been done by those living in the temperate zones, more especially in the north temperate zone. Western Canada lies in the same latitude as Central Europe, the home of the world's hardest and most progressive peoples. Clearly Mother Nature intended the wheat plains of Western Canada to be the cradle of a strong, new race. While it is true that the Prairie Belt of Canada is no country for either mental or physical weaklings, that the man who succeeds here, like the man who succeeds elsewhere, must be brave and a worker, still it is strikingly true that the climate of Manitoba, Saskatchewan, and Alberta is one of the most healthful and stimulating in the whole world.

Farmers, though, are more interested in summer crops than winter temperature. If they get the fervid sunshine at the maturing time, the winter frosts need not worry them. The long hours of intense sunshine on the prairies are a revelation to newcomers. One may read in June till 9:30 p. m. in the open air in a most marvelous twilight, and by 3:00 o'clock in the morning the sun is again well on his rounds.

To the superficial observer, latitude has always been a bugbear when Canada is under consideration. Let us look at a few facts. Edmonton is 1,000 miles northwest of Winnipeg, and St. Paul, in Minnesota, is 500 miles south of Winnipeg, yet Edmonton's average annual temperature is as high as that of St. Paul. Manitoba has a similar climate to that of northern Michigan. The mean temperature in Winnipeg for July is sixty-six degrees, which is warmer than the July weather in any part of England. Flower growth in the valley of the Mackenzie is almost coincident in time with the flower growth in the valley of the Mississippi. Wild flax grows within the Arctic circle, and there are wheat fields and flourmills at Vermilion-on-the-Peace in latitude 58° 30'.

The warm chinook winds sweeping down through the passes of the Rockies over the farms of Central Canada melt the snow and mellow the soil. These are facts; and it is conditions, not theories, that the farmer must face.

VARIETY OF RESOURCES.

The industrial future of Prairie Canada is based upon a wonderful variety of natural resources. Attention has been chiefly directed to the opportunity in wheat, but in a plain which stretches 1,000 miles one way and over 600 miles another, inducements of diverse character offer. The surface of the country consists of a series of terraced plains running northwest and southeast parallel to the Rockies. Western Alberta extends to and beyond the foot-hills of the Rocky Mountains, with elevations as high as 4,000 feet above sea level. Passing east from here the foot-hills give way to a great prairie steppe embracing about three-fourths of Alberta. The average elevation of this section is 2,000 feet above sea level. The next great elevated plain, with a mean height of 1,000 feet, broadly speaking, includes the whole province of Saskatchewan. And the major part of Manitoba attains an elevation of between 500 and 1,000 feet.

The resources of these three provinces make possible successful farming of every description. "Extensive" farming, that is, grazing and grain growing, has blazed the way on the prairies. Now, mixed, or "intensive," farming is treading close on the heels of the wheat grower.

Comparisons are sometimes illuminating. In Canada, a population less than that of greater London, in addition to one already completed, is now throwing two additional great world highways across a region which, twenty-five years ago, was stigmatized as an unproductive desert. The *Wall Street Journal* declares that within five years the Canadian Northern and Canadian Pacific, alone, will haul more wheat to the seaboard than all the railways of the United States combined. Lord Strathcona says: "At the end of the twentieth century Canada will have a population twice as large as that of the British Isles."

Population.—The people are coming in. The population of the three prairie provinces grew from 400,000 in 1901, to about a million and a quarter in 1910. It is no country for drones.

The man who does not work in Canada, whether he be a rich man or a poor man, is looked upon with suspicion by the rest.

Forest Reserves and Tree Culture.—Numerous forest reserves have been established throughout the western provinces. These serve a double purpose: They protect the sources of the principal rivers and streams and provide for a timber supply for future years.

Not so long ago, the people of Central Canada were told they could grow no trees except the Manitoba maple, the poplar, and the birch. Broadway, in Winnipeg, is one of the most beautiful streets in the world, and the elms have made it so. The foliage has become so thick that the trees will have to be thinned out. Of all the elms planted in Winnipeg not one per cent has died. In several western towns there are splendid avenues of trees, of a few years' growth.

The Dominion Government has for some years actively encouraged tree culture by individual farmers in the Prairie Districts. It not only provides free seeds but also provides for supervision of the planting and for inspection of the plantation from time to time by experts. Up to the present (1910) sixteen and one-half million trees have been planted under this government scheme.

Water.—There are very few districts where water cannot be readily secured. In some cases the provincial governments supply machinery for sinking test wells. Artesian wells, with a never-failing supply, have solved the water question in some parts. Then again, there is the river and lake system of the country. In selecting land, some prefer lands having dips or depressions, which not only supply water, but also ensure sufficient native hay for horses, cattle, and sheep that may require "housing" during a part of the winter.

Value of Farm Lands Increasing.—The crops of the last seven years and the impetus given thereby to immigration have been prime factors in promoting an upward trend of values. The prices asked at present for good agricultural land are not high.

Those competent to judge say that the crops of Western Canada will make farming on land worth \$100 per acre profitable. Thus it will be seen that the value attached to property at present is remarkably low considering the productive capacity of the soil. In 1901 lands were for sale by the different railway companies at prices averaging from \$3 to \$4 per acre, and now they range from \$10 to \$15 per acre and upwards. Prices in 1915 may be advanced as much beyond present values as those quoted are in excess of the figures of seven or eight years ago.

The person desirous of buying should investigate thoroughly. There is so much good land for sale, and so many good companies through whom to do business, that no one need be duped in a transaction of this nature. The land departments of the different railways having lands for sale supply prices and terms to prospective purchasers.

Not Grain Alone.—The wonderful production of grain—wheat, oats, barley, flax, and rye—in Central Canada has aroused the attention of the world, and throughout the United States the interest has grown so that 125,000 Americans took up their residence in Canada during the year 1910. But grain has not been the only source of revenue for the prairie farmers. It is calculated that in 1910 the farmer's revenue was increased by twenty-two million dollars by sales of potatoes, turnips, and other roots, hay, cattle, hogs, sheep, dairy products, and poultry.

Is Central Canada Reliable in Its Production?—Experience is the best guide, and the thousands of farmers who are becoming well off in the Canadian West and who are sending for their friends and relative to come to share the West's prosperity, offer the best answer to the question. But there are figures which demonstrate the matter very effectually. They are the figures regarding the actual quantities of grain shipped via the various railways and inspected by government officers, in connection with the shipping. The farmer has to retain large quantities of grain for seed and feed and other purposes, but he ships out his surplus, and the surplus it is that brings him in the cash. There

is no guessing or estimating in regard to the quantity of grain shipped and inspected, and while one year may be better than another the reliability of the soil in the matter of productivity is shown by the steadily growing figures of grain inspections. The following are the official figures (in bushels) in regard to grain inspected at Winnipeg and other prairie points during a period of years:

	1905	1906	1907	1908	1909	1910
Wheat ..	39,786,600	64,619,100	73,140,920	53,389,350	74,055,450	94,922,385
Oats	2,736,000	8,652,000	14,935,500	16,761,600	21,996,009	34,944,800
Barley ..	486,000	1,628,400	2,715,600	2,635,200	3,579,600	4,663,200
Flax	288,000	503,000	908,000	1,617,000	2,208,000	3,571,000
Rye .....	.....	9,600	26,400	10,800	20,400	22,800
Speltz	2,000	.....	1,200	1,200	.....	.....
Total..	43,280,600	75,412,100	91,727,620	74,415,150	101,859,450	138,064,185

MANITOBA.

Manitoba, the most easterly of the three Central Provinces, lies in the center of the North American continent and midway between the Pacific and Atlantic oceans, its southern boundary running down to the forty-ninth parallel, which separates it from the United States. Manitoba is one-fourth larger than Germany, its area covering 252,000 square miles, or about 161 million acres. If a family of five were to be placed on every half-section of the surveyed land in Manitoba, over 600,000 souls would be actually living on the land.

Education.—The value placed by Manitobans on popular education is evidenced in the fact that the expenditure on schools is the largest drain on the public funds. All schools below the grade of high schools are free to children between the ages of five and fifteen years, and high schools in all the cities and larger towns are free to resident pupils. Winnipeg and Brandon maintain colleges of a very high standard, and children of all classes attend them. Two sections of and in each township are set apart, the income from the sales of which is applied to the support of free schools. This also applies to Saskatchewan and Alberta.

An experimental farm at Brandon educates the farming population, and authentic records of the results of practical work in agricultural experiment are furnished to farmers free. Dairy schools, farmers' institutes, live-stock associations, and other agricultural organizations are well established.

Rivers and Lakes.—The province is served by the natural drainage system making into Hudson Bay by way of Lake Winnipeg. The rivers run from the eastern and western sides to the lower lands in the center, and practically all of the drainage of the province reaches the sea by the rivers making out of the natural reservoir of Lake Winnipeg. The chief rivers are the Red, Assiniboine, Winnipeg, and Pembina, all of which have important tributaries, except the Winnipeg. The rivers are not rapid, but there is force enough in the Winnipeg to supply electric power for tramways and industrial purposes for many cities as large as Winnipeg.

Telephones.—The government of Manitoba owns and operates the telephone system of the province. There are now over 5,000 miles of long distance lines, and about 9,000 rural subscribers.

Forest Wealth.—For those who love timber-covered areas, Manitoba can point to a strip along its east boundary, approximately eighty miles wide, of spruce, birch, and tamarack, which extends into the extreme east of the province from the wooded lands of New Ontario. Large sawmills are established. In Western Manitoba are forest areas, and timbered districts exist on the Turtle Mountains and the Brandon Hills. The true forest persists in Northwestern Manitoba as far as the Duck Mountains. From all these points quantities of lumber, fence posts, and firewood are sent to the prairie settlers, and the rivers and lakes are skirted by a plentiful tree growth.

Soil and Surface.—The surface of Manitoba is not a flat, bare stretch, a "bald-headed prairie." A large part of the land, especially in the south, is flat, being, geologists say, the bed of a wide, prehistoric lake. But even in the southwest the land rises into wooded hills, and in the southeast, close to the Lake-of-

the-Woods country, there is a genuine forest. Down through the heart of the province stretch two great lake chains, Lake Winnipeg and Lakes Winnipegosis and Manitoba. These receive as tribute the waters of the Saskatchewan and Assiniboine west, and discharge through the Nelson River to Hudson Bay. Sloping to the west from the Lake Manitoba plain is a range of hills known as the Duck Mountains, Riding Mountains, and the Porcupine Hills. These hills are modest in their height, have a gentle slope, and in no way interfere with the fact that almost the whole land surface of Manitoba west of its great lakes is ready for cultivation. Manitoba soil is a deep rich loam, inexhaustible in its productiveness; it is essentially agricultural. There are twenty-five and one-half million acres of land surveyed, about one-fourth of which was under crop in 1911.

Railroads.—The growing and marketing of grain are the chief industries of Manitoba, and the extension of the railways goes hand in hand with the development of the land. The railway mileage of the province is 3,796, and few farmers are more than eight or ten miles from a railway.

Game and Fish.—In 1911, Manitoba's fishery output represented a value of over one million dollars, most of this being realized from the lucrative whitefish. Wild ducks, geese, and swans haunt the lakes and rivers, while on the prairies are flocks of prairie chickens. On the hills and in the woodland moose and deer abound, and there are wolf, bear, lynx, fox, marten, beaver, and other fur-bearing animals.

Available Homesteads.—Manitoba has one and one-half million acres of land available for free homesteading, located east of the Red River, and between Lakes Winnipeg and Manitoba, where railways are now building, also west of Lake Manitoba and in the newly opened districts along the line of the Canadian Northern railway. To those who appreciate the picturesque advantage of tree growth, these districts make strong appeal. If the timber is a light scrub, it is easily removed; if, on the other hand, the forest is heavy, it richly repays the cost of clearing. Creeks,

lakes, and rivers abound, while water for domestic purposes can generally be secured by sinking wells to a moderate depth. It is easy to realize that Manitoba lands as they produce their crops from year to year are steadily advancing in value; while the interest accrues regularly, the principal is also increasing.

Dairying.—The dairy produce (butter) for 1911 was valued at one and three-quarters million dollars; the cheese output was about \$72,000—showing that dairying is a very important industry; good prices are obtained; the quality is excellent in colour and flavour. Abundant grasses are rich in the fattening properties essential to raising cattle and producing butter and cheese. Government dairy schools promote these industries.

Mixed Farming General.—Grain growing has given Manitoba agricultural pre-eminence in the eyes of the world, but the leaven of mixed farming is gradually and surely permeating the minds of farmers; there is scarcely one but has his herd of cattle or his flock of sheep. His hogs are fattening for market, and poultry proves valuable as a source of revenue. Prices of these may fluctuate, but never can a farmer become overstocked with any one or more of them.

Manitoba's surplus product of wheat over and above her home consumption is largely sent to Eastern Canada and to Europe. In addition to wheat, great crops of rye, flax, hay, peas, and potatoes are produced, and also garden truck.

Businesslike Farming.—Nowhere on the continent, more than in Manitoba, has farming advanced to the dignity of a thoroughly businesslike occupation. Here the farmer works, not merely for a living, but, rather, for a handsome profit. Instances are frequent where large areas under wheat have given a clear profit of over \$12 an acre. All the labour of ploughing, seeding, harvesting, and marketing can be hired done at about \$7.50 per acre. Even allowing \$8, it is a poor year that will not yield a handsome margin over this.

Winnipeg.—Winnipeg is a remarkable city. In 1870, it was a frontier trading post of the Hudson Bay Company with a total

population of 215 souls. The civic official census gives a population for 1911 of over 172,000. The reason for this wonderful advancement is readily found in the harvests of wheat ripening on the rich prairie lands tributary to this "Buckle of the Wheat Belt." The wide boulevarded streets, substantial bank buildings, crowded railroad depots, all tell insistently the same story of prosperity. The city owns its public parks, quarries, waterworks, street lighting systems, and asphalt plant. The total bank clearings for the year 1911, amounting to \$1,172,962,144, raised Winnipeg to the billion dollar class of cities. The year 1911 showed an increase of 219 million dollars over 1910, placing the city at the head of all financial centers on the continent, in increased percentage of clearings over 1910. There are 115 churches and forty schools, four live daily newspapers, with forty weekly and monthly publications. The building records for the city for the seven years ending December, 1911, show that seventy-seven million dollars were spent during that period. In 1911 the new buildings constructed were valued at seventeen and one-quarter million dollars. The factories employ 15,000 hands, with an output exceeding nearly thirty-six million dollars. Twenty-two railway tracks radiate from the city. Winnipeg leads the world as a grain center. The wheat receipts for 1911 were 101,326,250 bushels; Minneapolis 98,647,850; Chicago, 42,629,751. Oat receipts, Winnipeg, 26,128,800; Minneapolis, 11,400,000.

St. Boniface, the seat of the Roman Catholic archdiocese of St. Boniface, adjoins and is partly surrounded by the business section of the city of Winnipeg, estimated population, 13,000.

Brandon.—Brandon, the second city in the province, is situated at the junction of the Assiniboine with the Little Saskatchewan, on the main line of the Canadian Pacific railway, some 130 miles west of Winnipeg. Seven branch railways make in here. Grain elevators, flour mills, and machine shops, together with the wholesale houses and fourteen branch banks, show the solid nature of the business of this city. Brandon is an educational

center with a college and high school of which a city ten times its size might well be proud. On the outskirts of the city is the Dominion Experimental Farm, a valuable institution admirably run. Population, 14,000.

Portage la Prairie.—Portage la Prairie, population 6,000, enjoys splendid railway facilities. Several industries are established here. It owns a beautiful park, has a fine educational system, including a collegiate institute, and supports many churches and fraternal societies. Portage Plains have been cropped for thirty consecutive years without a failure.

Selkirk is a distributing point of supplies for points on the shores of Lake Winnipeg.

Carberry and *Morden* are flourishing railway towns in the heart of the fine wheat-growing sections. Minnedosa, Neepawa, Dauphin, Carman, Virden, and Souris also are centers of notable grain-growing districts, and important railroad towns.

Scores of towns now developing afford openings for those desiring business opportunities, each with its mills and warehouses for wheat. Among these centres may be named Manitou, Birtle, Emerson, Gretna, Wawanessa, Somerset, Baldur, Deloraine, Melita, Rapid City, Hamiota, Gladstone, Killarney, Hartney, Stonewall, Boissevain, Elkhorn, Gilbert Plains, Pilot Mound, Winkler and Plum Coulee.

Important Facts.—In 1911 the estimated amount spent on farm buildings was three and one-half million dollars as compared with two and one-half million dollars the previous year. There are 3,193 threshing outfits in the province. Potatoes last year averaged 187 bushels to the acre.

GROWTH OF MANITOBA.

	1891	1908	1909	1911
Population	152,506	.....	.....	455,614
Horses	86,735	230,926	237,161	232,725
Milch cows	82,710	173,546	167,442	146,841
Other horned cattle.....	147,984	357,988	333,752	397,261
Sheep	35,838	29,265	29,074	32,223
Hogs	54,177	192,489	172,374	176,212
Cultivated farms .....	.....	.....	45,380	.....

Increase in population in ten years was 78.52 per cent.

The following tables give the acreage, average, and total yield of wheat, oats, barley, and flax for the last five years.

Year	WHEAT			OATS		
	Acreage	Average Yield	Total Yield	Acreage	Average Yield	Total Yield
1907.....	2,789,553	14.22	39,688,266.6	1,213,596	34.8	42,140,744
1908.....	2,850,640	17.23	49,252,539	1,216,632	36.8	44,686,043
1909.....	2,642,111	17.33	45,774,707.7	1,373,683	37.1	50,983,056
1910.....	2,962,187	13.475	39,916,391.7	1,486,436	28.7	42,647,766
1911.....	3,350,000	18.29	61,058,786	1,625,000	45.3	73,786,683

Year	BARLEY			FLAX		
	Acreage	Average Yield	Total Yield	Acreage	Average Yield	Total Yield
1907.....	649,570	25.7	16,752,724.3	25,915	12.25	317,347
1908.....	658,441	27.54	18,135,757	50,187	11.18	502,206
1909.....	601,008	27.31	16,416,634	20,635	12.26	253,636
1910.....	624,644	20.75	12,960,038.7	41,002	9.97	410,928
1911.....	760,000	31.5	21,000,000	86,000	14.	1,205,727

The Harvest of 1911.—With spring opening early, seeding was completed under the most favorable conditions, and the weather, right up to the time of harvesting, was all that could be wished for with the exception of a slight drought, which was more felt along the international boundary line; a spell of wet weather then set in, greatly retarding threshing; nevertheless, the harvest was exceedingly bountiful.

While some of the wheat was slightly off color, on the whole both quantity and quality were good, and showed an average yield of 18.29, and a total yield of 61,058,786 bushels, as compared with an average of 13.47, and a total yield of 39,916,391 bushels, in 1910.

Oats showed a much larger increase, both in average and in yield; namely, an average of 45.3 and a total yield of 73,786,683 bushels, as compared with an average of 28.7, and a total yield of 42,647,766 bushels in 1910.

Barley also increased; the average being 31.5 and the total yield being 29,999,239 bushels, as against an average of 20.75 and a total yield of 12,960,038 bushels in 1910.

Mixed Farming in the Park Region.—The district of country lying east and southeast of Winnipeg is being well served by railways,—the Canadian Pacific, Canadian Northern and Grand

Trunk Pacific. The soil here is a very deep rich loam, and capable of producing an excellent quality of small grain of all kinds, and the experience of those who are farming there is that the yield is always large. There is a sufficiency of rainfall, and water is easy to procure. A great quantity of this land is still vacant, and some homesteads are available. An advantage over the more open prairie districts, claimed by some, is the greatest possibility for mixed farming and cattle raising, on account of the superior quality of the grasses, the shelter afforded by the groves of trees, and the cheapness with which buildings are constructed.

Manitoba farm lands,—raw prairie,—are selling from \$12 to \$15 an acre and upwards, while improved farms sell from \$35 to \$40 an acre.

The Swan River Valley during the past few years has been attracting the attention of an excellent class of settlers. It has splendid railway advantages, and there is promise of additional branch lines being built into the district to accommodate the grain growers and cattle raisers of the district. Winter wheat is being grown here with great success. The country is largely open prairie, but in parts there is sufficient of the park-like country to add a charm and give plenty of native hay and shelter. In all of the district there is a good growth of wild grasses. At the Dominion Fair, held at Regina in 1911, the exhibit of grains, grasses, clovers, fodder crops, fruit, vegetables and natural products sent from Swan River Valley won third prize for all Canada, which speaks more than all else of the climate and nature of the soil. The settlement is mostly composed of Americans and people from the Old Country. There are homesteads to be had in the district, and other land may be purchased from railway and responsible land companies.

When the newly acquired territory recently added to Manitoba is surveyed there will be opened up a wonderfully rich area, capable of maintaining an immense population. This added territory will greatly increase the area of the province, and give

it a port on Hudson Bay, into which large ocean going vessels will be in a position to carry a considerable portion of the farm produce of the West to old country markets.

SASKATCHEWAN.

Saskatchewan, the middle one of the Prairie Provinces, is a huge rectangle extending from the forty-ninth to the sixtieth parallel, with an area as big as that of France, and twice the size of the British Isles. Saskatchewan has a southern base of 390 miles bordering on the United States, and its length from north to south is 760 miles. The total land area of the Province of Saskatchewan is 155,092,480 acres. The Province may be defined as consisting to four distinct zones. These, proceeding from south to north are: (a) rolling prairie, (b) prairie and woodland, (c) forest, (d) sparsely timbered belt. Of the enormous area given above less than twelve million acres, or about one-thirteenth, is cultivated. Notwithstanding this fact, Saskatchewan stood second among the wheat-producing States and Provinces of this continent in 1910. It has produced 400 million bushels of wheat in the past twelve years. Its increase in population in ten years was 440 per cent.

River Ways.—The chief rivers are the North Saskatchewan, South Saskatchewan, Qu'Appelle, and Carrot. The North and South Saskatchewan both rise in the Rocky Mountains and each has a general easterly trend. The Red Deer flows into the South Saskatchewan, about 150 miles north of the United States boundary. The South Saskatchewan runs east nearly half way across the Province, then turns north and enters the North Saskatchewan River a little east of the town of Prince Albert. The South Saskatchewan River, with the Qu'Appelle, intersects the Province from east to west. The Carrot rises south of Prince Albert and runs an approximate parallel line to the North Saskatchewan, into which it flows near "The Pas," a Hudson Bay Company trading post.

Surface and Settlement.—The first tide of homeseekers into

Saskatchewan flowed along the channel provided by the Canadian Pacific Railway, and each new railroad since built has been followed close at heel by eager, earnest land-seekers. So it is that one finds to-day prosperous settlements on both sides of the tracks of the Canadian Northern, the Canadian Pacific and the Grand Trunk Pacific.

Railways.—Saskatchewan is well served by the Canadian Pacific, Canadian Northern, and Grand Trunk Pacific railways, and very few of the older settlements are more than ten or twenty miles from transportation. Into the newer sections, where homesteads are available, all these roads are rapidly extending their lines.

Saskatchewan Crops.—Saskatchewan leads all the other provinces in wheat production, though only a comparatively small portion of its cultivable area has yet been brought under the plough.

In 1898 the area under wheat in Saskatchewan was 276,253 acres; in 1905 it was 910,359 acres; in 1908 2,703,563 acres, and in 1911 or in three years' time, according to Dominion Government figures, it had nearly doubled, the area being 4,704,660 acres. On this area there was grown approximately ninety-seven million bushels of wheat, or an average of twenty bushels to the acre. This is a fair average, in spite of the fact that this Province, with the rest of the West, suffered from unfavorable weather conditions. As it is, the farmers of Saskatchewan have had a very successful year, as will be seen by the following tables, showing a total value of $121\frac{1}{4}$ million dollars for field products apart from field and fodder crops.

Roots and forage crops for 1911 are valued at twelve million dollars.

FIELD PRODUCTS OF SASKATCHEWAN FOR A TERM OF YEARS

Year	WHEAT			OATS		
	Total Yield	Average Yield per Acre	Total Value 1911	Total Yield	Average Yield per Acre	Total Value 1911
1905....	26,107,286	23.09		19,213,055	42.70	
1906....	37,010,098	21.40		23,965,528	37.45	
1908....	50,654,629	13.68		48,379,838	27.29	
1909....	90,277,000	22.04		105,465,000	42.04	
1910....	72,666,000	15.58		63,315,000	30.40	
*1911....	97,665,000	20.8	\$63,000,000	97,962,000	46.12	\$34,250,000

Year	BARLEY			FLAX		
	Total Yield	Average Yield per Acre	Total Value 1911	Total Yield	Average Yield per Acre	Total Value 1911
1905....	893,396	27.11		398,399	15.73	
1906....	1,316,415	24.57		710,698	9.35	
1908....	3,965,724	17.23		2,589,352	9.78	
1909....	7,833,000	32.01		4,448,700	13.09	
1910....	5,859,018	26.01		3,044,138	9.66	
*1911....	5,445,000	31.61	\$3,000,000	10,688,000	11.25	\$21,000,000

* According to Dominion census figures the local government gives the average yield of wheat at 18.50, oats 45, barley 28, flax 11.13.

HOW SASKATCHEWAN HAS GROWN

	1901	1906	1909	1911	Value 1911
Population	91,279	263,713	341,521	492,432	
Horses	83,461	240,566	429,766	718,346	\$114,935,360
Milch Cows	56,440	112,618	234,458	250,600	12,530,000
Other Horned Cattle....	160,613	360,236	594,632	565,350	14,133,750
Sheep	73,097	121,290	152,601	197,826	1,236,412
Swine	27,753	123,916	352,385	352,118	3,523,059

Total value of all products..... \$146,359,372

Dairying.—Natural conditions in certain parts of the Province are eminently suitable for mixed farming and dairying. Locally there is an excellent market for butter. Most of the creameries are under government supervision, the Minister of Agriculture, through the Superintendent of Dairying, supervising all business transactions with the exception of cream delivery. A reasonable estimate places the output of butter for 1911, at 1,202,801 pounds, valued at \$282,688. The output of 1910 was 861,000 pounds, value \$208,972. Adjacent districts to those in which

creameries are now being operated, will, without doubt, follow dairying as their chief occupations; and rightly so, because of the favorable natural facilities which with intelligent application on the part of the settler makes success easily possible. The number of farmers supplying cream increased from 553 in 1908 to 1,596 in 1911.

Lumbering.—North of Prince Albert, which is the centre at present of the lumbering industry, and east of that city, lumbering is extensively carried on. In the northern forest the timber is spruce, both white and black, larch or tamarack, jack pine, aspen or white poplar, balsam or black poplar, and white birch. Prince Albert has four lumber mills.

Education.—School districts are established by the Government, but maintained and managed by the resident rate-payers of the district. The minimum size of rural districts is limited to twenty-five square miles, but the majority comprise from sixteen to twenty. A district must have four persons actually resident therein, who would be liable to assessment, and at least twelve children between the ages of five and sixteen years, inclusive. The schools are sustained by provincial aid and also by local rates. Except in special cases where qualified teachers cannot be obtained, every teacher must hold a certificate of qualification granted by the department of education. A university, supported and controlled by the Province, has been established at Saskatoon. A department of Saskatchewan's new university will be a college of agriculture.

The education of the farmer is the constant concern of the local agricultural authorities in Canada, and nowhere does this receive greater attention than in the newer districts.

Government and Other Telephones.—The Government of the Province operates the telephone system. This comprised in 1911 over 1,300 miles of long-distance lines, forty-two exchanges, and upwards of 5,000 subscribers. In addition, the Government pursues an active policy of stimulating the organization of local rural companies by giving to such companies as a bonus all the

poles required for their lines. During 1911, over \$60,000 worth of telephone poles were distributed gratis to farmers' telephone companies. As a result of this policy there were in existence at the close of 1911 seventy-one such rural companies with a total capitalization in excess of \$250,000. These rural companies are connected with local exchanges and toll offices wherever possible, and represent 1,900 pole miles serving upwards of 2,000 farmers.

Cities, Towns and Villages, Regina.—The capital, 360 miles west of Winnipeg, lies in the heart of a splendid agricultural district, and is a wholesale centre. It is noted for its substantial public buildings and paved streets, is well supplied with hotel accommodation and boasts a dozen banks. It has a collegiate institute and provincial normal school. The city is the headquarters of the Royal Northwest Mounted Police, and also of the judiciary of Saskatchewan; population, 30,210. The total building permits in Regina for 1911 amounted to \$5,088,110, as compared with \$2,352,228 in 1910.

The bank clearings in 1911 amounted to \$72,487,159, as compared with \$14,153,244 in 1909. The Canadian Pacific, Canadian Northern, and Grand Trunk Pacific Railways unite to make Regina an important centre.

Moose Jaw.—Forty miles west of Regina, is a Canadian Pacific Railway divisinal point, and the terminus of the Soo Line and of the line under construction from Moose Jaw to Lacombe via Outlook, with the Canadian Northern and Grand Trunk Pacific projected. It is noted for its schools and churches; and has also extensive stock yards. Moose Jaw spent \$2,475,136 in building in 1911, \$500,000 in 1909. Population, 14,000.

Saskatoon.—The seat of the University of Saskatchewan, is a growing city beautifully situated on the south branch of the Saskatchewan. It is well served by railways, being located on the Canadian Northern's Regina-Prince Albert Line and on the route of the Canadian Pacific Line from Winnipeg to Edmonton. Grand Trunk Pacific trains run to what is practically the suburbs, and connection is made with Canadian Northern main-line

trains at Warman, while an extensive territory to the southwest is served by the line that runs into that excellent farming district. Population, about 20,000. Building permits for 1911 amounted to \$4,920,000 as compared with \$943,000 in 1909.

Prince Albert.—Is the northern terminus of the Canadian Northern, and has a delightful situation on the north branch of the Saskatchewan. A line of the Grand Trunk Pacific is expected to reach there in the fall of 1912. The Canadian Northern has a portion of its line to Battleford completed. It has four big saw-mills, is well supplied with banks, churches, schools, and hotels; population, 6,250; building permits, 1911, \$920,145, 1909, \$144,000. For two years in succession, the district of Prince Albert carried off the prize in Red Fyfe for North Saskatchewan at Regina; in 1910 at Brandon for all Western Canada. There are at present three flour mills grinding about 400 barrels a day. One local mill ships a large proportion of its product to Scotland.

Indian Head.—The largest incorporated town in Saskatchewan, has more elevators than any other town in the Province. For some time it enjoyed the distinction of being the largest initial wheat-shipping point in the world. The Dominion Government experimental farm is there.

Moosomin.—Two hundred and twenty miles west of Winnipeg on the main line of the Canadian Pacific Railway, is a flourishing town surrounded by a rolling prairie country particularly adapted to mixed farming. It has a population of 1,200, good churches, schools, banks, grain elevators, and waterworks.

Yorkton.—Two hundred and eighty miles northwest of Winnipeg, on the Canadian Pacific Railway, has within the last five years doubled its population. Yorkton ships annually over two million bushels of grain and is a very up-to-date town of about 2,500 inhabitants, with creditable municipal buildings, eight wheat elevators, water works, sewerage system, flour mill, saw-mill, cement sidewalks, telephone, and a municipal gas plant.

Wolsely.—Three hundred miles west of Winnipeg, is the west-

ern terminus of the Wolsely-Reston branch of the Canadian Pacific Railway.

Swift Current.—One hundred and twelve miles west of Moose Jaw, is a divisional point of the Canadian Pacific Railway and a busy railway town. Today Swift Current is the largest initial wheat market on the American continent. Five years ago it was thought that the district from a point twenty miles west of Moose Jaw to the western boundary of the Province, and south to the United States boundary was fitted only for horse ranching, cattle and sheep grazing, but now the land is practically all homesteaded in every direction from Swift Current. Railway branch lines are being extended from Swift Current to the northwest and to the southeast through fairly well settled districts. Population, 2,000.

Battleford.—Population, 1,500 and North Battleford, population, 2,300, as the centres of prosperous communities. These towns are so advantageously situated that the Canadian Northern and Grand Trunk Pacific Railways are here building branch lines north and south, opening up splendid agricultural districts. Considerable rivalry exists between the two towns, both are growing finely, and they have every promise of a big future. Efforts are now being made to secure branch lines of the Canadian Pacific Railway.

Qu'Appelle and *Arcola* are enterprising towns. Among the largest incorporated villages in Saskatchewan are Broadview, a divisional point on the Canadian Pacific Railway main line; Grenfell, also on the main line; Duck Lake, on the Regina-Prince Albert branch; Alameda, Balgonie, Lemberg, Lloydminster, Melfort, Rouleau, and Sintaluta. Portal is the point where the Soo Line enters Saskatchewan. Yellow Grass, Milestone, and Drinkwater are newer towns on the Soo Line, settled within the past few years by progressive farmers from the States. Important and growing towns on the Grand Trunk Pacific are Melville, Watrous, Scott and Nokomis.

Maple Creek, for many years the centre of a ranching section, has a population of 1,000, and the country around is rapidly filling up with settlers. Estevan is noted for its coal mines and enjoys direct rail connections with Winnipeg. Weyburn is a prosperous town on the Soo Line of the Canadian Pacific Railway between Moose Jaw and North Portal and is connected by railway with Stoughton, thus furnishing a direct route to the east. Rothern, on the Regina-Prince Albert branch of the Canadian Northern, is in the centre of a good agricultural district.

A glance at the map will show many another town that has sprung into existence in the last couple of years, laying claim to population of from 300 to 800. Such are Outlook, Rosetown, Kindersley, Kerrobert, Lanigan, and a score besides.

Summing Up.—In forming an estimate of the future of Saskatchewan, it is well to remember that this Province lies in the same latitude as the British Isles. Denmark, Belgium, and the greater part of Germany are as far north as Regina. Edinburgh is nearer the top of the map than is any one of the settled parts of Saskatchewan. Christiania and St. Petersburg are on the sixtieth parallel of latitude, which is the northern boundary of this Province.

The coal areas to the south, and the partially wooded areas in the north, provide an ample supply of fuel, while water can generally be secured at a reasonable depth.

SOUTHEASTERN SASKATCHEWAN.

One may include in Southeastern Saskatchewan that section which lies between Manitoba on the east and the third meridian on the west and extending some distance north of the main line of the Canadian Pacific Railway. It has more rainfall than that farther west and less wood than the portion lying north. In character and productiveness of soil, Southeastern Saskatchewan is a continuation of Manitoba, but contains more prairie area.

Soil Almost Inexhaustible.—The possibilities of Southeastern Saskatchewan cannot be better shown than by instancing the re-

sults of tests made at the Experimental Farm at Indian Head. A dozen distinct varieties of wheat, sown in mid April, were cut in 130 days and yielded an average of forty-three bushels to the acre. Six reasons may be given for the exceptionally favorable conditions awaiting the grower of wheat in Saskatchewan: 1. The soil is almost inexhaustible in its fertility. 2. The climate brings the wheat plant to fruition very quickly. 3. The northern latitude gives the wheat more sunshine during the period of growth than is furnished by the districts farther south. 4. Cyclones never occur. 5. Rust is of infrequent occurrence. 6. Insect foes are unknown.

There are few homesteads available in this district. The land is well occupied by an excellent class of farmers, and land values range from \$15 per acre to \$25 for unimproved farms.

SOUTHWESTERN SASKATCHEWAN.

During the year 1908 the Government opened up for homesteading and pre-emption all available lands in Southwestern Saskatchewan. The demand for these is great and there is market for the adjoining acres held by railway and land companies. North of the South Saskatchewan River extends an almost level fertile plain.

Between Regina and Moose Jaw the country is mostly occupied by prosperous farmers. In the neighborhood of Moose Jaw mixed farming as well as grain raising is carried on with success. North and northwest, towards the Saskatchewan, there are large settlements of contented and prosperous farmers. Recent surveys south and southwest have opened a tract of land available for homesteading, and the establishment of a land office at Moose Jaw makes it easy to inspect the land and secure speedy entry. These lands are easily reached from Moose Jaw, Mortlach, Herbert, and Swift Current.

Maple Creek district is an important stock centre and shipping point for the big ranches to the west and south, some of the best sheep, and horses in Canada being raised on the suc-

culent grass that here obtains. Here as elsewhere, the wheat grower and mixed farmer are treading on the heels of the ranchman and the cow-puncher.

West of Swift Current to the Alberta boundary herds of cattle roam and largely find for themselves. Snowfall is light and winters so mild that hardy animals graze through the whole year. The chinook winds from the Pacific are strongly felt as far east as Swift Current. Grain growing is being successfully carried on both to the north and south.

CENTRAL SASKATCHEWAN.

Central Saskatchewan is watered east and west by the main Saskatchewan River and by its chief branch, the North Saskatchewan, a great part of whose navigable length lies within this section. The surface generally is rolling prairie interspersed with bluffs of poplar, spruce, and pine, alternating with intruding portions of the great plain from the south. In soil and climate Central Saskatchewan is well adapted to the raising of cattle, wheat and other grains.

Quite an area of the best land is still open for free homesteading, but lies chiefly to the north of the central belt. The homesteader in many parts may add to his holdings by purchasing adjoining land from the land companies of the Canadian Northern, Canadian Pacific Railway, and other corporations. These unimproved lands are obtainable at from \$15 an acre, upwards.

Districts recently opened for settlement are the Shellbrook, the Beaver River, and Green Lake, into which the Canadian Northern Railway is projected. Other new districts are the Jack Fish Lake and Turtle Lake, north of Battleford, into which the same road is being built. These districts are favorable for grain and cattle raising. North of North Battleford, there have recently been surveyed several townships of land, which will not be long without a line of railway and to the

east of these again there is a splendid lot of available homesteads.

NORTHERN SASKATCHEWAN.

Northern Saskatchewan has not yet been opened to any extent for settlement. There are approximately eighty million acres beyond the railway at Prince Albert, a heritage which time, zeal, and railway enterprise will eventually make accessible to the world. The furs, forest wealth, and fisheries are recognized as a national asset, but thousands of acres of fertile land lie beyond the existing lines of railway, which await future development. Northern Saskatchewan has natural resources sufficient to maintain a population equal to that of any European country in corresponding latitude.

ALBERTA.

Alberta, the most westerly of the three Prairie Provinces, is twice the size of Great Britain and Ireland, much larger than either France or Germany and has a greater area than the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Pennsylvania combined. The area of arable land alone in Alberta is placed at one hundred million acres, and this provincial empire, with its great wealth in agricultural lands, mines, forests and fisheries, has less than 400,000 people.

Alberta is a vast sloping plateau from 3,000 to 2,000 feet above sea-level, hung by its western edge on the foothills of the Rocky Mountains. It slopes gently toward the east and north. Absolutely level plains form no great proportion of the surface of the country. By far the larger proportion is undulating country diversified by forest, stream, hills and open country not unlike Ontario or New York State. Beautiful lakes fringed with forest and abounding in whitefish are scattered over its Central and Northern area. Everywhere luxuriant grasses and flowers cover the open country which formed

the chief feeding grounds of the innumerable herds of bison of the past.

While open and treeless country characterizes the southern part of the province, great stretches of prairie extend to the northern limits to the Hay River and the McKenzie River. The prairie of the south passes into woodland to reappear again in higher latitudes. In other localities there is an agreeable alteration of woodland and prairie. This character prevails 600 or 700 miles north of the Saskatchewan River which in course of time may be made accessible by railways.

Rivers.—The province is the source of two of the four great river systems of the North American Continent—The Saskatchewan, and the McKenzie. The Saskatchewan is divided into two great arteries, one of which with its tributaries, the Bow, Belly, St. Mary's, Old Man and Red Deer, waters the south, while the north branch, with the Brazeau, Clearwater, Sturgeon, Battle, Blindman and Vermilion as tributaries, waters the great central plains. The Peace and the Athabaska drain the north. Alberta's lakes are chiefly in the northern part, there being Lake Athabaska 120 miles long and Lesser Slave sixty miles long, and many bodies of water only a few acres in extent.

Railways.—Besides its main line the Canadian Pacific Railway has two branches from Calgary—one north to Strathcona, the other south to Macleod. Two branches running eastward diverge at Lacombe and Wetaskiwin. Another branch leaves the Canadian Pacific Railway main line near Medicine Hat passes through Lethbridge and Macleod and crosses the mountains by the Crow's Nest Pass. A southern line of the Canadian Pacific will connect Lethbridge with Weyburn, on the "Soo" line and when completed will open up a large area of splendid agricultural land. Provincial mileage, 1,273. Other lines connecting up the branch system are being built.

The Canadian Northern enters Alberta from the east at Lloydminster and crosses the Saskatchewan River at Fort Sas-

katchewan on its way to the capital, Edmonton. From Edmonton this pioneer road has lines projected and partially constructed north and west, and also one starting at Vegreville to connect its main line with Calgary, and then extended south-easterly toward Lethbridge and Macleod. Mileage in the Province, 393.

The Grand Trunk Pacific trans-continental system serves the territory lying between the Canadian Northern and the Canadian Pacific Railway, operating trains through a fertile and productive territory. This Company has also completed a line south from Tofield to Calgary. Provincial mileage, 445.

From Lethbridge the Alberta Railway & Irrigation Company's line runs south to the international boundary, and a branch southwesterly from Stirling.

Another road is under construction running northward from the international boundary through Pincher, with Calgary as a northern terminus.

In addition to this the government has outlined a policy of railway development throughout the province in general, and the north country in particular, which is rich in natural resources and possesses agricultural land which attracts those settlers desirous of taking up free homestead land not to be found now to a large extent in other parts of the province.

There are settlements all along the various lines, and adjoining the available homesteads are farm lands open to purchase from the railways, land companies, and private owners at reasonable prices and on easy terms. Total railway mileage, January, 1912, 2,111.

The building of highways between all important points has become a matter of great interest to the local Government. A million dollars will be spent this year in the construction of roads and bridges.

Cities and Towns of Alberta.—High up on the banks of the Saskatchewan and forming the portal alike to the Last West and the New North, the capital city of Edmonton has attrac-

tions for the capitalist, the tourist, the manufacturer, and the seeker for health. Located in the centre of two great trans-continental highways, within a decade Edmonton will be rated among the world's great ones. Traffic from the Pacific to Hudson Bay will go through her portals, the south will contribute, and the trade of the Great North country is hers, alone. Possessed of her own waterworks, electric-lighting and power systems street railway, telephones, the city is modern, attractive, and instinet with growing life. Fifteen banks are evidence of prosperity, with their clearinghouse totals of over 122 million dollars a year, as compared with fifty million dollars in 1909, Edmonton occupies the tenth place in the cities of the Dominion. The erection of the Parliament buildings, substantial postoffice, new court house, with large pork-packing plants, and other solid buildings are unmistakable signs of faith and works, and each year emphasises her right to her distinctive municipal motto—"Industry, Energy, and Enterprise." Building permits in Edmonton in 1911 amounted to three million dollars as against two million in 1910. Population, according to census 1911, 24,882, which with Strathcona now added, is increased to 30,000. Edmonton recently added the city of Strathcona with its Provincial University.

Calgary has written its own story in public and permanent buildings along its substantial streets. It has over one hundred wholesale establishments, 300 retail stores, fifteen chartered banks, and half a hundred manufacturing establishments, a Young Men's Christian Association Hall costing \$40,000, and a \$150,000 normal school building. The chief streets are paved. There is municipal ownership of sewer system, waterworks, and electric light. The gravity water system, which carries a supply sufficient for a city of 200,000 people, cost about \$350,000. Directly bearing upon the future of Calgary is the irrigation project of the Bow River Valley, where three million acres are being colonized. On this work already over eight million dollars has been expended, and there are in active operation

1,200 miles of canals and laterals. Population according to census 1911 was 43,736. Building permits in 1911 amounted to twelve and three-quarters million dollars or more than double those of 1910. Bank clearings 1911, \$219,245,879, as compared evidenced by the establishment of the Canadian Pacific car shops, to employ about 2,000 men. It has the Canadian Pacific, Canadian Northern and Grand Trunk Pacific.

Lethbridge, with a population of about 10,000 is a prosperous coal-mining and commercial town in Southern Alberta. The output of the mines finds a ready market in British Columbia, in Montana, and as far east as Winnipeg. A Government Experimental Farm near Lethbridge demonstrates what are the best grains to be grown and how to grow them. The hardier varieties of summer and fall apples can be successfully grown. Bank clearings 1911, \$28,530,298. Building permits were over one million dollars. Four lines of railway assist in making it an important railway centre. The World's "Dry Farming" Congress for 1912 was held at Lethbridge.

Medicine Hat, situated in the valley of the South Saskatchewan, is the centre of a magnificent ranching and mixed-farming district. It is a divisional point, with extensive railway shops all operated by natural gas. The light, heat, and power, derived from natural gas, is sold to manufacturers at five cents per thousand cubic feet, and for domestic purposes at one cent. Building permits in 1911 were nearly half a million dollars; population upwards of 6,000.

Wetaskiwin is a railway divisional point from which stretch farms in all directions. The location of the city, near the Peace Hills, is very beautiful. Wetaskiwin owns its electric light plant, and a system of waterworks and sewerage. Raymond, in Southern Alberta, has had a rapid growth. A sugar factory is the chief industry. Red Deer is situated on the Canadian Pacific, half way between Calgary and Edmonton, many of its citizens being formerly Americans. There is operated here a large sawmill, two brick-yards, concrete works, cream-

eries, wheat elevators, and a sash-and-door factory. Coal and wood are plentiful and cheap. The district has never had a crop failure, and blizzards are unknown. Lacombe is on the direct line between Calgary and Edmonton. It has a flour mill, foundry, planing-mill, brick-yard, grain elevators, electric lights, and telephones. The country surrounding is noted for its pure-bred cattle and horses, and a Government Experimental Farm adjoins the town.

Macleod and Cardston give promise of substantial growth. Other towns that are doing well and in their air of prosperity give the stamp to the surrounding farming country are Claresholm, Didsbury, Fort Saskatchewan, High River, Innisfail, Olds, Okotoks, Pincher Creek, Ponoka, St. Albert, Vermilion, Vegreville, Carmangay, Stettler, Taber, Tofield, Camrose, Wainwright, and, now a good deal of interest is being taken in Athabaska Landing on account of the agricultural settlement that is under way, and the completion of the Canadian Northern to that point.

GROWTH OF ALBERTA.

	1901	1906	1908	1909	1911
Population	73,022	185,412	265,820	273,859	374,663
Horses	93,001	226,534	246,922	263,713	.....
Milch cows	46,295	101,245	110,357	116,371	.....
Other horned cattle	329,391	849,387	934,326	910,547	.....
Sheep	80,055	154,266	161,979	171,422	.....
Hogs	46,163	114,623	115,769	139,270	.....
Cultivated farms in Alberta .....	.....	.....	.....	45,000	.....

Increase in population in ten years was 413 per cent.

Soil and Products.—Alberta has a wealth and diversity of natural products. A great proportion of the land is undulating prairie, well watered, and covered with a deep, black loam, in many places four and five feet in thickness, whose fertility and depth give it a growing power practically inexhaustible. Allowing that one-half of the surface of the Province is taken up with lake, timber lands, and second-quality soil, a conservative estimate gives eighty million acres of first-class wheat land in Alberta. This would allow a 160-acre farm each to

half a million farmers, making possible for the future an agricultural population of two and one-half million souls.

For the Settler.—It is to the problems of agricultural education and railway extension that Alberta lawmakers are first addressing themselves. The formation of agricultural societies is encouraged, the dissemination of exact scientific knowledge is carried on by means of farmers' institutes, stock-judging schools, seed fairs, and traveling dairies. The raising of pure-bred stock is assisted by government grants. Experimental farms have been established through the Province, the idea being to convince the farmers that mixed farming is more profitable than all grain raising. The teaching of scientific farming has the greatest attention, and it is thought that it will not be long before agricultural high schools will be started, while agriculture will form part of the curriculum of the public schools.

The age of progress demands the formation of municipalities and this it is expected will shortly be brought about, whereby a certain number of residents under certain conditions may form a municipality, when they will have the power to issue debentures for permanent improvements. It is equitable to have the future generation pay for a share of the improvements they enjoy, and secondly to lessen the demand upon current revenue.

Educational Facilities.—A system of free public schools has been established. The organization of districts is optional with the settlers, the Government liberally supporting all public schools. School population at end of 1911, 46,048; number of schools, 1,254. The University of Alberta has been established by the Provincial Government and will afford every opportunity for higher education, while there are preparatory schools at Calgary, Lethbridge and other towns.

Poultry Raising.—In a country where the winter price of fresh eggs ranges from fifty to sixty cents a dozen, and where the summer price rarely falls below twenty-five cents, extensive develop-

ments along this profitable line of mixed farming cannot be long delayed.

Dairying.—The dairy industry is destined to assume considerable proportions in Alberta. In the creameries operated by the Government for the farmers, over two one one-half million pounds of butter were produced in 1910, which, sold at an average of twenty-five cents per pound, gives an estimated value of about \$600,000. Butter from private dairies gave \$250,000; cheese factories, \$28,000, a grand total of dairy products of \$880,000. Local conditions prevail for the dairy herd—abundance of feed, good water, and healthful climate. In sparsely settled districts the Government sends a traveling dairy for instruction.

Handling the Grain.—In 1905, Alberta's elevators had a capacity of 1,715,000 bushels; in 1911, the capacity was over 9 million bushels. Such is the history of progress throughout all Central Canada. In 1909, there were 1,100 threshing outfits in the Province.

Stock.—Alberta is the Kentucky of Canada with regard to horse breeding. Its high altitude, dry and invigorating atmosphere, short and mild winters, its nutritious grasses and inexhaustible supply of clear, cold water, make it pre-eminently adapted for horse breeding, and the Alberta animal is noted for its endurance, lung power and freedom from hereditary and other diseases. Nearly all the breeds of horses known are represented on the farms and ranches. Horses winter out at a nominal expense and without grain or even hay feeding. Alberta is now supplying the province of British Columbia and the Yukon Territory with beef, as well as providing for a large export trade to the Old Country.

Four-year-old range steers which have never been under a roof nor fed a pound of grain, and less than a ton of hay, weigh about 1,500 pounds by the first of August and if allowed to run till October go as high as 1,650 pounds.

Telephones.—The province owns and operates its own tele-

phones. Long distance mileage, 3,500 miles; rural lines, 2,500 miles; number of subscribers, 1,030. It has 1,700 telephones and a capital outlay of \$3,800,000.

Mineral Resources.—Alberta has enormous coal and lignite areas, the production of coal in 1911 being over three million tons, values at over seven and one-half million dollars. The settlement of the country, together with the great railway construction, will mean a rapid increase in coal consumption. Its coal supply is practically inexhaustible, and underlies much of the whole province in seams from four to twelve feet thick, to be found in outcroppings on the banks of every stream and in shafts from twenty to 150 feet deep. All grades are found, lignite, bituminous and anthracite. The total formation contains not less than 12,800 square miles and has an estimated content of 71,000,000,000 tons.

Natural gas, under heavy pressure, has been found at Medicine Hat, Dunmore Junction, and Bow Island on the South Saskatchewan, and at Pelican Rapids on the Athabaska. Excellent indications of the existence of petroleum have been found both in the south near the British Columbia boundary, and in the north in the vicinity of Fort McMurray and southward, and it is confidently expected that important commercial oil fields will soon be located.

Fish.—The Great Lakes of the North furnish yearly half a million pounds of incomparable white fish, while the fur wealth of the North is an important asset.

The Province naturally falls into three divisions, exhibiting marked distinctions in climatic and typographical conditions—Southern, Central, and Northern Alberta.

SOUTHERN ALBERTA.

Southern Alberta is open and rolling, and devoid of timber except along the streams and the Rocky Mountain foot-hills. The soil is a fertile loam. The climate is ideal, with pleasing summers and mild winters. Stock pasture in the open air dur-

ing winter, grazing on the nutritive sun-dried grasses. The absence of timber in Southern Alberta is compensated for by the supply of coal.

For years this district was almost entirely a horse and cattle country, but now winter wheat is pushing the cowboy back, the range being rapidly converted into fields of grain and areas of sugar-beets. With the introduction of "Alberta Red," a new era was ushered in for winter wheat. Sown on new breaking or summer-fallowed land from the middle of July to the end of September, winter wheat is ready for the reaper from the first to the fifteenth of August in the following year. Climate and soil combine to make Southern Alberta the ideal district for the growth of this cereal. Considerable spring wheat is also grown, and for sugar-beet growing it compares favorably with Germany and the world.

The total acreage of winter wheat for the Province in 1911, according to Dominion census figures, was 317,000, the average yield being twenty-five bushels an acre, and by far greater portion of this was grown in Southern Alberta. Around Lethbridge, Taber, Grassy Lake, Cardston, Spring Coulee, Pinche Creek, Macleod, Stavely, Leavitt, Claresholm, Nanton, High River, Okotoks and Calgary, winter wheat is grown. This wheat is in great demand on account of its milling qualities.

Water Supply and Irrigation.—Water for domestic and farm purposes is easily obtained at reasonable depth, and with an intelligent system of cultivation, aimed to make the best use of the rainfall, no fear need be entertained of shortage of moisture. In order to make sure that there would be no danger from this source, however, a number of irrigation ditches have been constructed.

In certain sections of the Canadian West as well as in the American West, there is a portion of the country in which the soil is the very best for the growing of cereals, but the geographical locations and relative positions to the rain avenues, do not give the advantage that other parts possess in the mat-

ter of precipitation. It is now ascertained that it is not altogether the number of inches of rain that is essential to the growing of crops, but its conservation, and that is the meaning of "dry farming." "Dry farming" may well be applied to districts where there is a heavy rainfall, and better results will follow. This system is being successfully followed in the southern portion of Southern Alberta. There are also portions of that district that can be easily and successfully farmed by means of irrigation. The Canadian Pacific Railway and the Southern Alberta Land Company have brought a large area under irrigation. The lands thus affected have increased considerably in value and find a ready market at from \$25.00 to \$35.00 an acre and upwards.

CENTRAL ALBERTA.

Central Alberta extends from the Red Deer River northward to the height of land between the Saskatchewan and the Athabaska. Hill and vale, clothed in grass and flowers, and dotted with spruce and aspen, mark this as the ideal land for the homes of a cultured people. Its great wealth is its dower of deep black humus varying in depth from ten inches to three feet, which overlies a warm sub-soil.

The Grains Grown.—Winter wheat and spring wheat are raised successfully. Dominion census figures give the spring wheat acreage for 1911 for the Province as 1,300,000 as compared with 304,000 in 1909. By far the greater portion of this was in Central Alberta. The area of oats under crop, according to authority above quoted, in 1911, was 1,178,000 acres as compared with 820,000 in 1909; yields of up to 100 bushels to the acre are recorded, the average being placed at forty-eight bushels by the Dominion government. Up to sixty bushels is the farmer's justified expectation, and Alberta already advocates a standard grade of oats calling for forty-two pounds to the bushel, as against the legal weight of thirty-two pounds in the Republic to the south.

Barley is a successful crop, about twenty-seven bushels to the acre being the average of 1911. Acreage was 156,000. Flax and native hay are standard crops.

New Territory Opened.—West and north of Edmonton, a territory being made accessible by the Grand Trunk Pacific and the Canadian Northern, there is an immense stretch of splendid country, in which there are available a large number of homesteads. Wheat and oats are certain crops. Wonderful yields of the latter are reported. The rainfall is certain and sure. Mixed farming can be carried on most successfully. The wild grasses and the pea vine are there in such profusion that there is always an ample supply of feed for stock, while water is convenient, plentiful, and easy to secure. The Stony Plain and Morinville districts are rapidly coming into prominence. On into the foothills and the mountains are splendid stretches of prairie land, through which the Grand Trunk Pacific is now constructed.

During the past year there was laid out three million acres of new land to the north, northeast, and northwest of Edmonton—practically all the unsubdivided land between Edmonton and Athabaska Landing—and between Edmonton and Lac la Biche to the northeast and along the main line of the Grand Trunk Pacific and north of that line.

Game.—Game is plentiful and varied. Ducks, prairie chickens, swans, geese, cranes, waveys, partridge, snipe, and plover afford excellent sport to the gunshot. Moose are obtainable in the north, with cariboo and red and blacktailed deer. Wolves, foxes, bears, with the badger, muskrat, martin, mink, otter, ermine, and wolverine furnish a fur supply which runs well up into large money value each winter.

More about the "Park" District.—The northern and western portions of Central Alberta has some brush, and frequently this land is avoided, the preference being for the open prairie. But those who have taken up what is termed "brush" land find they have a soil fully as good as that of the open prairie. They

think it better, the cost of clearing is slight, and they have the advantage of shelter, for cattle and an absolute assurance of splendid water at a reasonable depth. To these people the treeless prairie is a boon, for the cost of clearing their land is reduced—since there is now a ready market for the by-product formerly burnt up as useless. Eighty-five carloads of willow pickets were loaded at Leduc and shipped to the south and east. Farmers get two cents each for a willow picket with a two-inch top. Tamarac posts sell for seven cents for seven-foot length or at the rate of one cent per foot.

No Miasma.—Central Alberta's water supply is ample. None of the miasma of malaria exudes from this soil, and so ague and kindred troubles are unknown. No country in the world is healthier or more attractive.

NORTHERN ALBERTA.

Far north of the end of steel extends seventy-five per cent of this rich Province, a heritage as yet unexploited. When the railways push into the Athabaska and the Place, it will be realized that Alberta owns an Empire north of the Saskatchewan. This district has been set apart by Nature to provide homes for millions of agrarian people when the plains to the south are filled up.

The Deputy Minister of Agriculture, on the first of January, 1912, reports as follows:

I have worked out a table as given below which will give as correct an estimate of the season's crops as it is possible to give at the present time.

	Estimate in June Acres.	Estimate in the Fall Acres.	Estimate Yield per Acre.	Total Estimate Yield Bushels.
Winter wheat	183,444	175,000	18 Bu.	3,150,000
Spring wheat	672,754	650,000	20 Bu.	13,000,000
Oats	705,345	690,000	35 Bu.	24,150,000
Barley	123,247	120,000	30 Bu.	3,600,000
Flax	40,343	35,000	7 Bu.	245,000
Rye, Speltz, etc. ....	.....	30,000	20 Bu.	600,000
				<hr/> 44,745,000

	Total Yield of Grain.
1907.....	14,588,552
1908.....	25,073,147
1909.....	36,761,493
1910.....	22,027,184
1911.....	44,745,000

BRITISH COLUMBIA.

Stretching from the Rockies to the sea and from the United States to the sixtieth parallel, British Columbia is the largest Province in the Dominion. It is big enough to enable one to place in it, side by side at the same time, two Englands, three Irelands, and four Scotlands. Looking across the water to the millions of British subjects in India, in Hong-Kong, in Australia, and the isles of the sea, one catches brief pathetic glimpses of the commercial greatness which the Pacific has begun to waft to these shores. Nature intended British Columbia to develop a great seaward commerce, and substantial trade relations are now established northward to the Yukon and southward to Mexico. Population, June, 1911, 392,480.

British Columbia has natural wealth in her forests and her fish, in her whales and seals and fruit farms. But it is from her mines, more than from aught else, that she will derive her future wealth.

The parallel chains of the Rockies, the Selkirks, and the Coast Range are a rich dower. They furnish scenery unrivalled in its majesty; they are nurseries of great rivers which pour tribute into three oceans; and in their rocky embrace they hold a mineral wealth second to none.

British Columbia contains an aggregate of from sixteen million to twenty million unoccupied arable acres. Sir William Dawson has estimated that in the British Columbia section of the Peace River Valley alone, the wheat-growing area will amount to ten million acres. It is a country of big things.

Rivers.—All the great rivers flowing into the Pacific, with the exception of the Colorado, have their sources within the

boundaries of this Province. The most important of these are the Columbia, which has a course of 600 miles in British Columbia; the Fraser, 750 miles long; the Skeena, 300 miles long; the Thompson, the Kootenay, the Stikine, the Liard, and the Peace. These rivers with their tributaries drain an area of one-tenth of the whole of the North American continent. The lake area aggregates one and one-half million acres.

A Rich Province.—British Columbia coal measures are sufficient to supply the world for centuries. It possesses the greatest compact area of merchantable timber in the world. The mines are in the early stages of their development, and yet they have already produced over \$275,000,000. The fisheries return an average annual yield of \$7,500,000.

British Columbia's trade, per head of population, is the largest in the world. The chief exports are salmon, coal, gold, silver, copper, lead, timber, masts and spars, furs and skins, whale-oil, sealskins, hops, and fruit. An inter-provincial trade with Alberta, Saskatchewan, Manitoba, and the eastern provinces is developing, British Columbia fruit finding a ready and lucrative market there.

Railways.—The Canadian Pacific Railway maintains two main lines, the Canadian Pacific Railway proper and Crow's Nest Pass Railway, and several branches making connection with United States railway systems. It also employs a fleet of seventeen coastwise steamers. Its Empress liners make regular trips to China and Japan. The Canadian-Australian liners give service to Hawaii, Fiji, Australia and New Zealand.

The Grand Trunk Pacific, which will traverse Canada from the Pacific terminal, Prince Rupert, to Moncton, New Brunswick, is prosecuting work on its line from Prince Rupert eastward. This railway will open to settlement a vast area rich in timber, minerals, and agricultural soil.

The Great Northern enters the province at points on the boundary and the Canadian Northern has completed arrangements for construction to Vancouver. The combined railway

mileage of the province is 1,600 miles, being one mile of track for each 250 square miles of area.

Climate.—The Japan current and the moisture-bearing winds from the Pacific, exercise a moderating influence on the climate of the coast and provide a copious rainfall. The climate of British Columbia, as a whole, presents all the conditions to be met with in European countries lying within the Temperate Zone. Pure air, absence of extremes in temperature, freedom from malaria, make British Columbia one vast sanitarium. British Columbia is essentially the scenic province. Scarcely a farmhouse in all the valley regions is without a view of majestic mountains.

Mining.—British Columbia has been pertinently called “The Mineral Province,” a title justified by the fact that in 1907 her production of gold, silver, copper, lead, and coal amounted to sixty-four per cent of the combined output of the other eight provinces of Canada.

The Soil and Its Products.—British Columbia is so large that one has to explore it beyond the highway of the railroad to discover its agricultural and economic possibilities. Professor Macoun says, “The whole of British Columbia south of fifty-two degrees and east of the Coast Range is a grazing country up to 3,500 feet, and a farming country up to 2,500 feet where irrigation is possible.

As far north as fifty-five degrees excellent apples flourish, and in the southern belt the more delicate fruits, peaches, grapes, and apricots can be reared. Some stretches of the best agricultural land extend over areas as follows:

Nicola, Similkameen and Kettle River Valleys.....	350,000	acres
Okanagan	250,000	“
Lillooet and Caribou.....	200,000	“
East and West Kootenay.....	125,000	“
North and South Thompson Valley.....	75,000	“

West of the Coast Range stretch tracts of land, notably the lower Frazer Valley, Westminster district, Vancouver Island, and adjacent islands in the Gulf of Georgia. The opportunities for profitable diversified farming are practically unlimited.

Fruit Growing.—A small exhibit of British Columbia fruit sent to England in 1904 captured the gold medal of the Royal Horticultural Society. A car lot exhibited in London in 1905 won the first prize from all competitors. At least 1,000,000 acres south of fifty-two degrees will produce all the fruits of the temperate zone.

The recognized fruit districts include the southern part of Vancouver Island and the Gulf Islands, Lower Frazer Valley, Thompson Valley, Shuswap Lake, Okanagan, Osoyoos, Similkameen, Upper Columbia Valley, Kootenay Lake, Arrow Lake, Lower Columbia, Grand Forks, Nicola and Grand Prairie.

The fruit shipments of 1908 gave an increase of 1,700 tons over 1907. Over a million and a half fruit trees were imported during 1911. At Kelowna ten tons of prunes per acre is not an uncommon crop. On the Coldstream Ranch, near Vernon, twenty acres produced \$10,000 worth of Northern Spy apples. At Peachland an acre and a half of peaches gave a return of \$700. A cherry tree at Agassiz produced 1,000 pounds of fruit. There are now over 100,000 acres in orchard lands.

Agriculture.—"The agriculture of a country depends," says F. M. Logan, B. S. A., "upon its climate; British Columbia's agriculture must of necessity be varied. On Vancouver and the other islands adjacent to the west coast, there is less rainfall and less snow than in the lower valley of the Fraser, just a few miles distant. Other atmospheric conditions also differ. The great valleys of the interior boast of a climate altogether different from that of either district. Each has its own agriculture, with all the peculiarities pertaining to its climatic and topographical conditions, as well as to transportation facilities.

"On Vancouver Island there are no extensive tracts of good farming land so the farms are essentially small; one hundred acres under cultivation would be above the average size. The majority of these farms are occupied by recent settlers of the well-to-do class, principally from England. Some of these men are thrifty, progressive, ready to adopt Canadian ways, and

are making a success of farming in what might be called a small way. The better farmers of this district or division of the province devote their efforts to what might be called diversified farming. They nearly all keep a few cows, pigs, sheep and poultry, and have a small area planted to fruit.

"Dairy products are in great demand in Victoria, and producers get as high as two dollars per hundred pounds for their milk, and corresponding prices for cream and butter. Pork is always in good demand, as is also lamb and mutton.

"Small fruits and certain varieties of apples, pears and plums do well on these islands, and usually find a ready local market.

"The Fraser River valley is one of the most productive areas in the world. For about seventy miles up the river there are farms along its banks which yield their owners revenues from \$4,000 to \$7,000 a year. About 300,000 acres of this land was reclaimed, now worth from \$100 to \$1,000 an acre. As much as five tons of hay, 120 bushels of oats, twenty tons of potatoes, and fifty tons of roots have been raised per acre."

Speaking of the interior country, a magazine writer says: "A book could be written about this wonderful territory among the mountains. Thirty years ago, the agriculture of this vast region consisted in a few hundred cattle. Twenty years ago there were several thousands, but today, the fertile acres over which they roamed, unmolested, are producing the unexcelled fruit which has made British Columbia famous. The old rancher, with his ten or twenty thousand acres and his uncounted herds of cattle and horses has almost disappeared. The eight great ranches of the Okanagan Valley have been bought up by syndicates who have divided them into five, ten and twenty-acre farms; and where this land a few years ago supported one owner and a few cowboys, it now maintains a whole settlement, with an income fifty times that previously obtained.

"The whole nature of this country has been changed by

methods of modern agriculture. Water has been carried from the mountain streams by pipe lines running from five to fifty miles, and then distributed by a network of small ditches and furrows to the trees, shrubs, vines and flowers of this wonderful valley, which some day will be the garden spot of all Canada.

“In the Cariboo district and the territory north of the Canadian Pacific Railway a great country will be opened up by the Canadian Northern and the Grand Trunk Pacific Railways. Much of this country is too cold for successful fruit-growing, but is well suited for live stock and the growing of roots, vegetables and grains.

“There is another farming district, quite different from any I have mentioned, in what is popularly known as the Kootenays. Here the rainfall is greater, and irrigation is little needed. Then, there is the Columbia Valley, of which the world knows nothing, but possessing sufficient value to warrant the building of a railway south from Golden, on the main line of the Canadian Pacific Railway. There are thousands of acres along the International Boundary awaiting irrigation and transportation. In all this great, undeveloped country there is room for thousands of sturdy settlers.”

RELIABLE SOURCES OF INFORMATION.

The following is a list of the various Scientific Bureaus of the U. S. Department of Agriculture, Washington, D. C., and the Agricultural Experiment Stations in the various states of the Union. Any of these Bureaus or Experiment Stations may be freely consulted at any time. Most of the publications are for free distribution and no one should hesitate to write for any desired information along agricultural lines.

U. S. DEPARTMENT OF AGRICULTURE.

WASHINGTON, D. C.

Scientific Bureaus.

WEATHER BUREAU—Willis L. Moore, *Chief*.
 BUREAU OF ANIMAL INDUSTRY—A. D. Melvin, *Chief*.
 BUREAU OF PLANT INDUSTRY—B. T. Galloway, *Chief*.
 FOREST SERVICE—H. S. Graves, *Forester*.
 BUREAU OF SOILS—Milton Whitney, *Chief*.
 BUREAU OF CHEMISTRY—R. E. Doolittle, *Acting Chief*.
 BUREAU OF STATISTICS—V. H. Olmsted, *Statistician*.
 BUREAU OF ENTOMOLOGY—L. O. Howard, *Entomologist*.
 BUREAU OF BIOLOGICAL SURVEY—H. W. Henshaw, *Chief*.
 OFFICE OF PUBLIC ROADS—L. W. Page, *Director*.

OFFICE OF EXPERIMENT STATIONS—A. C. True, *Director*.

THE AGRICULTURAL EXPERIMENT STATIONS.

ALABAMA—

College Station: *Auburn*; J. F. Duggar.¹

Canebrake Station: *Uniontown*; L. H. Moore.¹

Tuskegee Station: *Tuskegee Institute*; G. W. Carver.¹

ALASKA—*Sitka*: C. C. Georgeson.²

ARIZONA—*Tucson*: R. H. Forbes.¹

ARKANSAS — *Fayetteville*: C. F. Adams.¹

CALIFORNIA — *Berkeley*: T. F. Hunt.¹

COLORADO—*Fort Collins*: C. P. Gillette.¹

CONNECTICUT—

State Station: *New Haven*; E. H. Jenkins.¹

Storrs Station: *Storrs*; —.

DELAWARE — *Newark*: H. Hayward.¹

FLORIDA—*Gainesville*: P. H. Rolfs.¹

GEORGIA—*Experiment*: Martin V. Calvin.¹

GUAM—*Island of Guam*: J. B. Thompson.²

¹ Director. ² Special agent in charge.

HAWAII—

Federal Station: *Honolulu*; E. V. Wilcox.²

Sugar Planters' Station: *Honolulu*; C. F. Eckart.²

IDAHO—*Moscow*: W. L. Carlyle.¹

ILLINOIS—*Urbana*: E. Davenport.¹

INDIANA—*La Fayette*: A. Goss.¹

IOWA—*Ames*: C. F. Curtiss.¹

KANSAS—*Manhattan*: E. H. Webster.¹

KENTUCKY—*Lexington*: J. H. Kas-
tle.¹

LOUISIANA—

State Station: *Baton Rouge*; W. R. Dodson.¹

Sugar Station: *Audubon Park, New Orleans*; W. R. Dodson.¹

North La. Station: *Calhoun*; W. R. Dodson.¹

MAINE—*Orono*: C. D. Woods.¹

MARYLAND—*College Park*: H. J. Patterson.¹

MASSACHUSETTS—*Amherst*: W. P. Brooks.¹

MICHIGAN—*East Lansing*: R. S. Shaw.¹

MINNESOTA—*University Farm, St. Paul*: A. F. Woods.¹

MISSISSIPPI—*Agricultural College*: E. R. Lloyd.¹

MISSOURI—

College Station: *Columbia*; F. B. Mumford.¹

Fruit Station: *Mountain Grove*; Paul Evans.¹

MONTANA—*Bozeman*: F. B. Linfield.¹

NEBRASKA—*Lincoln*: E. A. Burnett.¹

NEVADA—*Reno*: G. H. True.¹

NEW HAMPSHIRE—*Durham*: J. C. Kendall.¹

NEW JERSEY—*New Brunswick*: J. G. Lipman.¹

NEW MEXICO—*State College*: Luther Foster.¹

NEW YORK—

State Station: *Geneva*; W. H. Jordan.¹

Cornell Station: *Ithaca*; L. H. Bailey.¹

NORTH CAROLINA—

College Station: *West Raleigh*; B. W. Kilgore.¹

State Station: *Raleigh*; B. W. Kilgore.¹

NORTH DAKOTA—*Agricultural College*: J. H. Worst.¹

OHIO—*Wooster*: C. E. Thorne.¹

OKLAHOMA—*Stillwater*: J. A. Wilson.¹

OREGON — *Corvallis*: J. Withycombe.¹

PENNSYLVANIA—

State College: R. L. Watts.³

State College: Institute of Animal Nutrition, H. P. Armsby.¹

PORTO RICO—

Federal Station: *Mayaguez*; D. W. May.²

Sugar Planters' Station: *Rio Piedras*; J. T. Crawley.¹

RHODE ISLAND—*Kingston*: —.

SOUTH CAROLINA — *Clemson College*: J. N. Harper.¹

SOUTH DAKOTA—*Brookings*: J. W. Wilson.¹

TENNESSEE—*Knoxville*: H. A. Morgan.¹

TEXAS—*College Station*: B. Youngblood.¹

UTAH—*Logan*: E. D. Ball.¹

VERMONT — *Burlington*: J. L. Hills.¹

VIRGINIA—

Blacksburg: S. W. Fletcher.¹

Norfolk: Truck Station, T. C. Johnson.¹

WASHINGTON — *Pullman*: R. W. Thatcher.¹

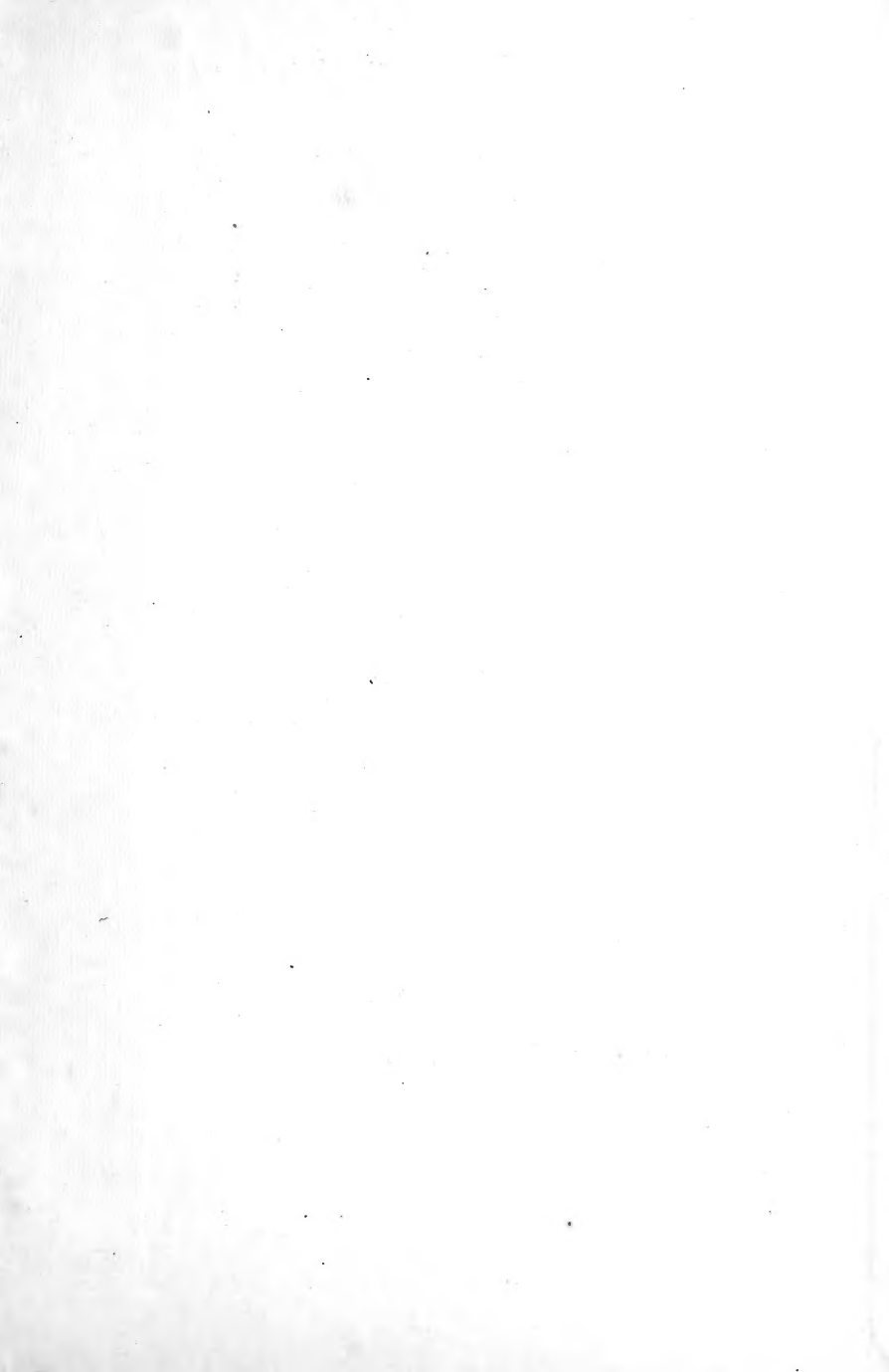
WEST VIRGINIA—*Morgantown*: E. D. Sanderson.¹

WISCONSIN—*Madison*: H. L. Russell.¹

WYOMING — *Laramie*: H. G. Knight.¹

¹ Director. ² Special agent in charge. ³ Acting director.

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